CADKEY

DataCAD®

Version 5

Mastering DataCAD Tutorial

Carol and Karl Buehrens

CADKEY

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CHAPTER 1

Let's Begin

Introduction

DataCAD is an easy to use software that is designed just for you: architect, facilities manager, space planner, or other architectural professional. This book will guide you through the use of many of the functions of DataCAD while you complete small projects. By the time you have finished this book, you will be well on the road to becoming an expert user!

During this chapter, you will practice drawing simple items and using the menus. To make life easier, you will not have a project. Instead you will draw a fun "mess" of lines and arcs. But this is okay since there is so much to learn at first.

2 Softwares In 1

DataCAD consists of both 2 dimensional drafting software and 3 dimensional modeling software. This book deals primarily with the "2-D" part, but you will also be using the 3-D part to view your drawing and to create some colored renderings.

Starting DataCAD

Before we go much further, it would be a good idea for you to start DataCAD. This way, you can look at the menus and use the options as they are described!

1. Install the DataCAD diskettes, as explained in the book: "Getting Started".

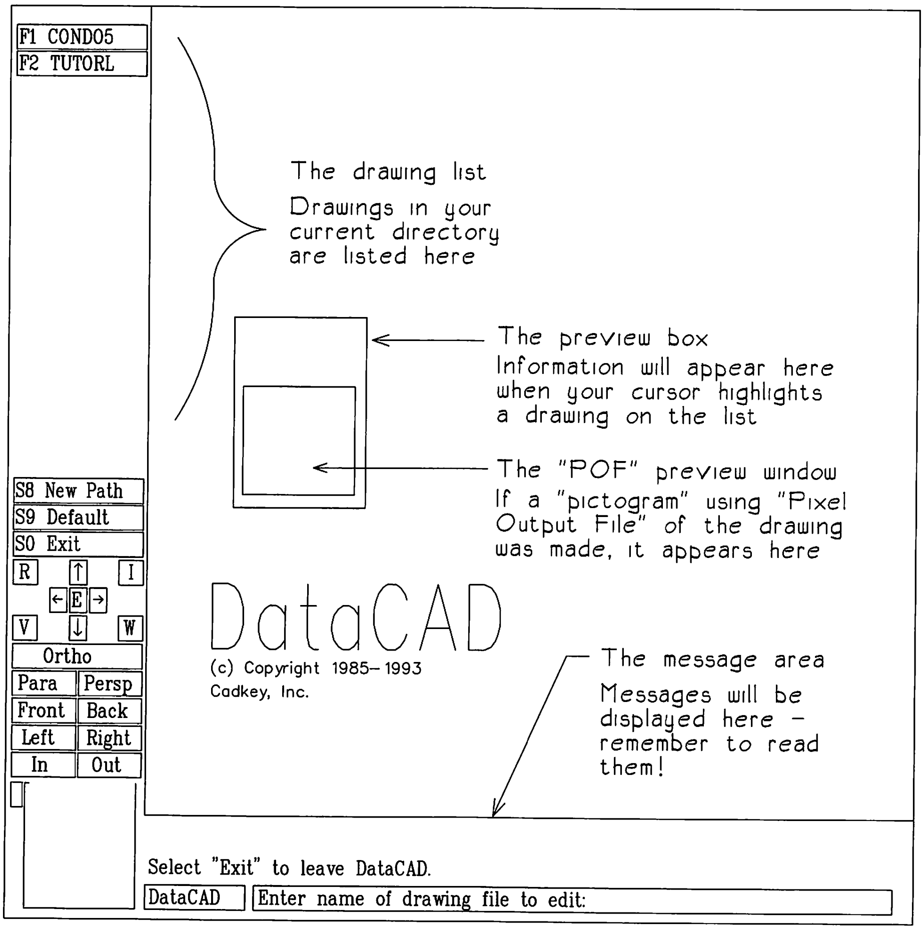
2. Configure DataCAD so that it runs properly with your computer hardware. This is also explained in the "Getting Started" book.
3. Type in: **rundcad** and press (Enter).

The Opening DataCAD Screen

The opening screen consists of 3 active parts: the drawing list, preview box and message area. These areas are noted in Figure 1.1.

The drawing list contains any drawing names that exist in the currently selected directory. If you pick a name, the drawing will appear on the screen.

The preview box works with the existing drawing names. When you move your cursor to a name, the preview box will display file information about the drawing, such as the date it was last edited and the file size.



The drawing list
Drawings in your current directory are listed here

The preview box
Information will appear here when your cursor highlights a drawing on the list

The "POF" preview window
If a "pictogram" using "Pixel Output File" of the drawing was made, it appears here

The message area
Messages will be displayed here – remember to read them!

Select "Exit" to leave DataCAD.

Enter name of drawing file to edit:

Figure 1.1: The opening screen.

Within the preview box is a little preview window that can display an image of the drawing, if one was created. Cadkey refers to this window as a POF window. POF stands for Pixel

Out File. The image of the drawing is actually a pixel drawing. You will learn how to use the "Pictogram" option to make images for your drawings.

The message area appears at the bottom of the screen (unless you have configured your system differently). When you start a drawing, the messages will still be at the bottom, in the same place. It is important to look at your messages because they help to guide you through the use of the system.

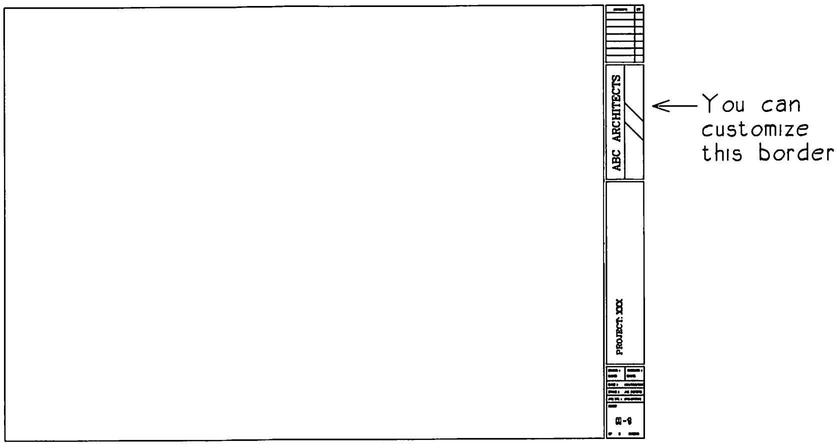
Starting a new drawing

Starting a new drawing is easy!

1. Pick **Default**. A list of available default drawing sheets should be displayed, such as PLAN_1-4.

   If there are no default drawing names displayed, the directory path may have been changed from the original system setting. To correct this:

   Pick the **NewPath** option.
   Type in **default** and press Enter. Existing default drawing sheets should now be displayed.
2. Pick **PLAN_1-4**. This will set up your drawing for a 1/4 = 1'-0" drawing on a 24" x 36" sheet.
3. Type in a new name: **draw1** and press (Enter). *(No spaces are allowed in a drawing name!)* A blank drawing sheet with a title block will appear, as in Figure 1.2.



You can customize this border

Figure 1.2: A blank drawing sheet, ready to draw.

Drawing Screen

The drawing screen is divided into 5 parts: the drawing area, the menu options, the control panel, the status and the message area.

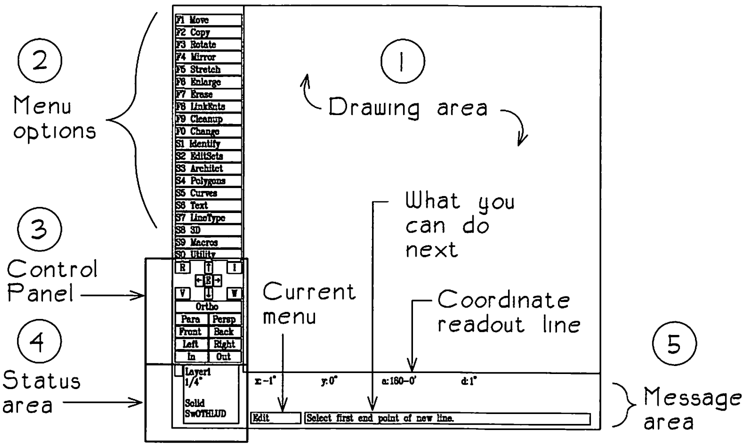
The drawing area is where you will draw. For example, if you move your cursor out into this area and pick, you will draw a line.

The menu options always appear in the same place, no matter what sub-menu you enter. You can pick any option by moving the cursor to it and pressing mouse button 1, pressing a function button that is displayed with the option (function keys 1 through 10 and [Shift] function keys 1 through 10), or in most cases, by using a "quick key". You will learn more on this soon.

The control panel contains buttons that can be picked with the cursor to use. You will use these buttons in Chapter 2.

Certain settings, such as the current layer and linetype, are displayed in the Status area.

The message area is where you will look to read X and Y coordinates. The currently active menu name will appear to the left, as shown in Figure 1.3. Any special instructions for using the menu will appear here too.



Edit

Select first end point of new line.

Figure 1.3: The 5 parts of the screen.

Drawing a Line

To draw a line, follow these simple steps.

1. Move your mouse to move the cursor into the drawing area.
2. Pick (press and release) with mouse button 1 (left-most button).
3. Move the cursor to another spot. Notice the line you are drawing.
4. Pick again.
5. Continue moving your cursor for the next line endpoint and picking with mouse button 1.

6. To stop drawing a line, press the right mouse button, mouse button 3.

Changing Colors

You can use a "Quick Key" to quickly change colors!

Use Quick Key!

K

1. Press **K**.
2. Continue drawing lines. Notice the color changed.
3. Press **K** again. There are 15 different colors available. Pressing K will take you "forward" through the list (white, red, green).
4. Hold down the **(Shift)** key and press **K**. This takes you "backward" through the list (green, red, white).

Orthogonal Mode

Believe it or not, you have been drawing in the "orthogonal mode". All this means is that you have been drawing lines that are restricted to an angle (in this case, 45 degrees). This technique is commonly referred to as "Ortho-mode" or "Ortho-lock". DataCAD will display a message about "Orthomode" as you turn it on or off. It is easy to turn this mode off and on.

Use Quick Key!

O

1. Press the letter **O** on your keyboard. ("Oh", not zero.) Notice the message area says "Orthomode is off."
2. Draw a few more lines. Can you see the difference?
3. Press the letter **O** again. This time the message area says "Orthomode is on."
4. Draw some lines. They are "stuck" on a 45 degree lock again.

2 Main Drafting Menus

There are two main drafting menus in DataCAD. These are the **Edit** and the **Utility** menus. These menus have many options that help you perform your job. As you pick an option, a new menu is displayed with simple choices. Messages corresponding to the choices appear in plain English so that you can simply read the message and know what to do next.

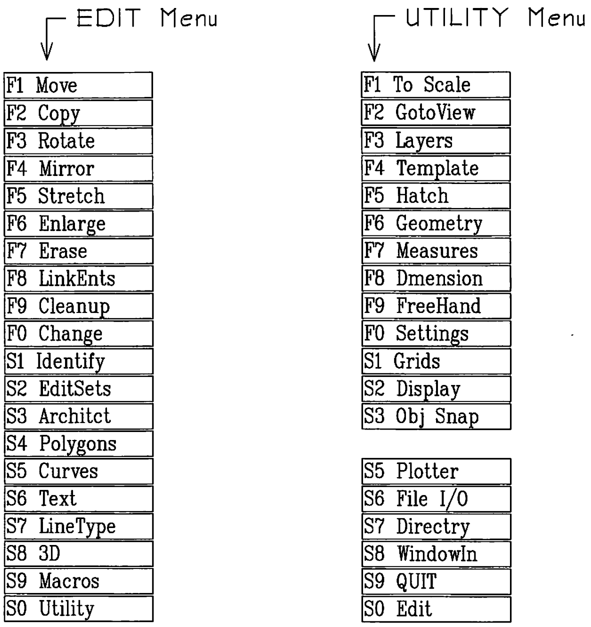
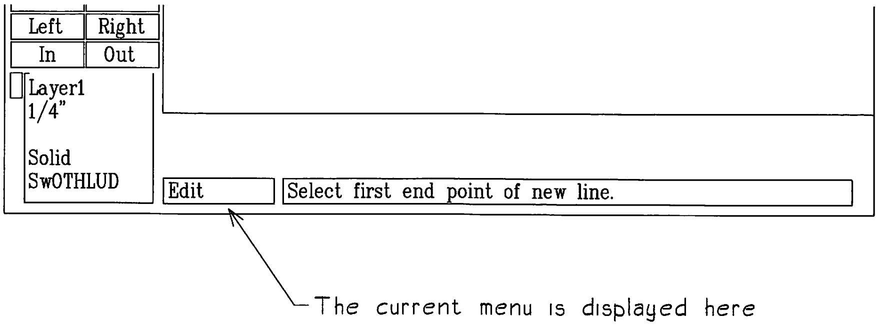


Figure 1.4: The Edit and the Utility menus.

Which menu are you in right now? The name of the current menu appears in the message area of your screen, as in Figure 1.5. This area will always display the menu name, even when you go into another menu, such as Erase.



Select first end point of new line.

The current menu is displayed here

Figure 1.5: The current menu name is shown in the message area.

1. Press Mouse button 3 (right most button) until you have stopped drawing lines. (If you have a two button mouse, press button 2 when instructed to use 3.)
2. Press Mouse button 3 again. Notice that the menu changes from **Edit** to **Utility**. Look to see what name appears in the message area.
3. Press Mouse button 3 again. Notice that the menu changes from **Utility** to **Edit**.

3 Button Mouse

The easiest "pointing" device to use with DataCAD is the 3-button mouse, shown in Figure 1.6. (A 2-button mouse works also.) You will learn how the buttons each have a particular function and when to use them.

Mouse button #1 - Picks on the screen, picks a menu option, picks an item during "Entity" mode.

Mouse button #2 - Object snaps onto an existing item, "Enters" typed in information when in typing mode (like the Enter key).

Mouse button #3 - Exits menus, selects option appearing in the S0 menu position, quits drawing of lines or other items.

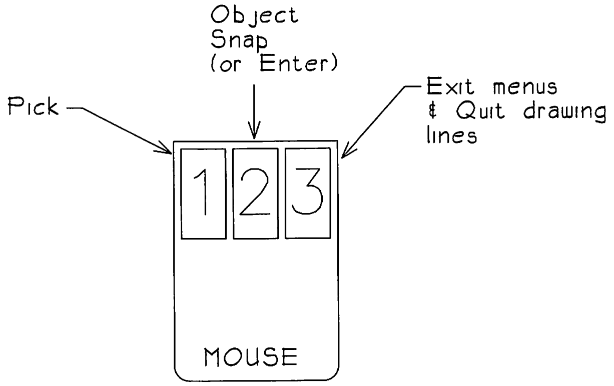


Figure 1.6: The three button mouse.

Note: *The buttons on a 2-button mouse works as #1 and #3. To get the same effect as using the middle button for object snapping - when instructed to use mouse button 2, press the letter* ***N*** *on your keyboard (Near snap). Remember to use this technique when instructed to use mouse button 2!*

Object Snapping

The middle button of your mouse, mouse button 2, is used to object snap. But, what is object snapping? It means to attach or "snap" onto an object, such as a line or an arc, by "grabbing" it. You can grab a line or an arc by its end points, its middle points, or even the point where two lines or arcs cross. And, it works on other items too, as shown in Figure 1.7.

1. Press mouse button 3 until you are not drawing a line.
2. Hold the cursor on a line in your drawing, close to an endpoint. The cursor must touch the line.
3. Press mouse button 2. It will grab the end. (Or - press the N key if you have a two-button mouse.)

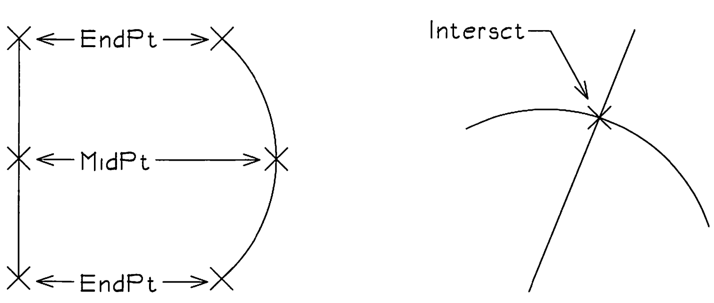


Figure 1.7: Endpoints, midpoints and intersections.

4. Now hold the cursor on another line in your drawing, close to the middle of the line (mid-section). Again, the cursor must touch the line.
5. Press mouse button 2. It will grab the exact middle.
6. Try snapping to other points on your lines by holding the cursor closer to the middle of a line or on an intersection.

***Note:** Remember, if you have a 2 button mouse, hold the cursor as explained, then press the **N** key on your keyboard.*

Erasing Items

Erasing items is very easy to do. To erase 1 item at a time:

Use Quick Key!

E

1. Press mouse button 3 until you are in the **Edit** menu. (Remember, the name of the menu appears in the message area of your screen.)
2. Pick the **Erase** option. Or, you can *quickly go to the erase menu* just by pressing **E** on the keyboard!
3. Look at the options listed at the top of the menu: Entity, Group, Area, and Fence. They are listed with the function key numbers F1, F2, F3 and F4. Which F number is green? The green indicates which option is active.
4. You will want the Entity option active. If it is not, pick **Entity** until the F1 number changes to green. Remember, once the F1 number by Entity is green, it means the option is active. If it was already green, you would not have to pick it - it is *already* active.

***Note:** Because F1 refers to the "function key" on your keyboard, you could just press function key F1 to pick Entity. F1 through F0 on the menu choices correspond to function keys F1 through F10. The S1 through S0 options can be selected by using the (Shift) key with the function keys.*

---

5. Hold your cursor on a line and pick with mouse button 1. Did it erase? If not, try again, making sure your cursor is touching the line.

6. To try other ways to erase, pick the **Undo** option to bring the item back. (You can only bring back the last erased item.)

You can also select a group of items. A group is a series of items that were made at one time, such as drawing a continuous line without pressing mouse button 3 to let go of it. To erase a group of items:

1. Pick **Group** until the function number is green, or press function key number F2.
2. Hold your cursor on a line and pick with mouse button 1. Many items may be erased. If only one item was erased, try again until you find a group!
3. If you wish to try other ways to erase, pick the **Undo** option to bring the items back.

Another way to erase is by indicating a box around items.

1. Pick **Area** until the function number is green.
2. Hold your cursor over to the upper left corner of the drawing screen and pick with mouse button 1, as in Figure 1.8.
3. Move your cursor. Notice that you are drawing a box. Hold your cursor by the lower right corner of the drawing screen and pick with mouse button 1. Only items **fully enclosed** by the box will be erased.
4. If you wish to try this again, pick the **Undo** option.

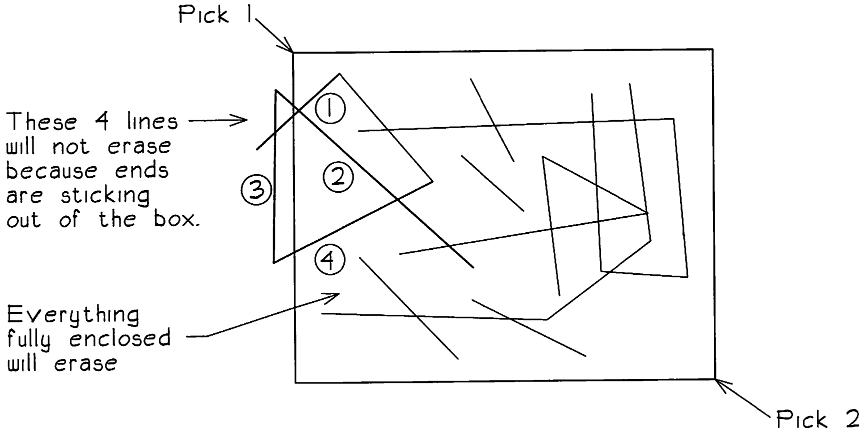

Pick 1
These 4 lines will not erase because ends are sticking out of the box.
①
②
③
④
Everything fully enclosed will erase
Pick 2

Figure 1.8: Indicating an area around items to be erased.

Another way to erase is by indicating a multi-sided fence around items.

1. Pick **Fence** until the function number is green.
2. Hold your cursor to the upper left corner of the drawing area and pick with mouse button 1, as shown in Figure 1.9.
3. Move your cursor. Notice that you are dragging a line. This will be the first line of your fence. Hold your cursor at another spot and pick with mouse button 1.
4. Move your cursor to another spot and pick again with mouse button 1.

5. Continue building your fence around items you want to erase. When you have everything you wish to erase surrounded with your fence, press mouse button 3. Anything **fully enclosed** by the box will be erased.

Note: *Up to 36 vertices (sides) can be defined in a fence.*

---

6. If you wish to try this again, pick the **Undo** option.

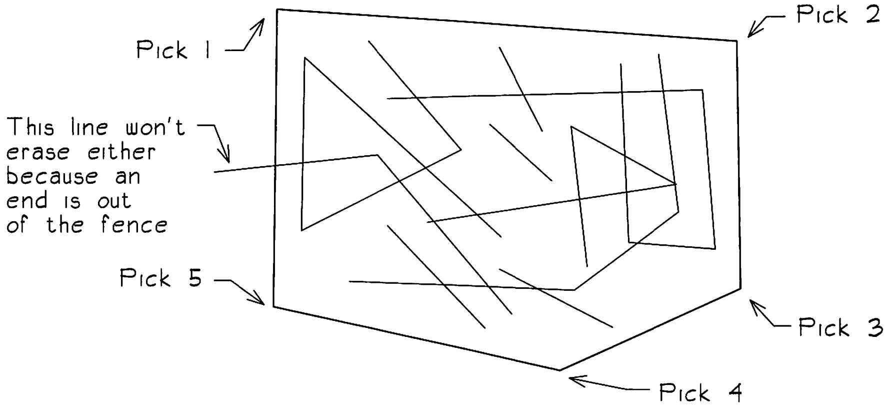

Pick 1
Pick 2
This line won't erase either because an end is out of the fence
Pick 5
Pick 3
Pick 4

Figure 1.9: Indicating a fence around items to be erased.

Drawing Arcs and Circles

Use Quick Key!

Alt

A

Let's try drawing some arcs!

1. Press mouse button 3 until you are in the **Edit** menu.
2. Pick the **Curves** option, *or press* **(Alt) A**.
3. Pick the **3 pt Arc** option. This arc takes 3 simple picks to draw, as in Figure 1.10.

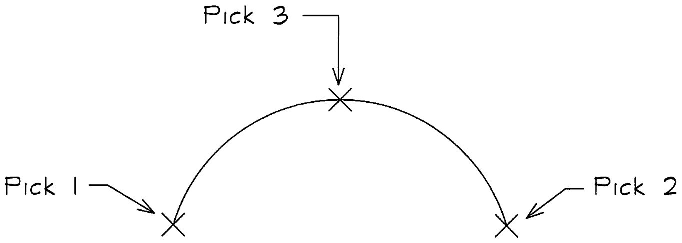


Figure 1.10: Three picks define an arc.

4. Pick a point in your drawing. This will be the first endpoint of your arc.
5. Move your cursor over and pick again. This will be the second endpoint of your arc.
6. Now when you move your cursor, you will see an arc attached to it. If it is hard to view your arc, it may be because Orthomode is on. Press **O** until "Orthomode is off". Move your cursor again. Better?
7. Pick again to define the arc, as shown in Figure 1.10.

8. When you are done, press mouse button 3 to exit back to the Curves menu.

Try using the **2 pt Arc**, **Dia Circ** and the **Rad Circ** options and others in the Curves menu. Remember to read the messages that appear in the message area of your screen. They guide you to the use of these options. Remember to press **K** to change your colors and make your drawing interesting!

Quick Erase & Restore

As you are drawing, there are some times when you make a small mistake in drawing a line, arc, or other object and want to quickly erase what you did. DataCAD allows you to do this by using some quick keys.

Use Quick Key!

<

1. Press the **(<)** key. (Do not use the (Shift) key.) The very last *item* you drew will erase.
2. Now, hold down the **(Shift)** key and press the **(<)** key. The very last *group* you drew will erase.
3. Press the **(>)** key. Whatever you deleted last will be restored. Again, only the last item or group you erased can be restored.

Use Quick Key!

>

Note: *In the DataCAD documentation, the quick erase is shown as "," and the quick restore is shown as ".". Notice that these are the same keys as < and >.*

Filing your drawing

While you are working on a drawing, you will want to periodically save it to the hard disk. All you have to do is press capital F, for File. DataCAD refers to this as a "Forced save".

Use Quick Key!

Shift

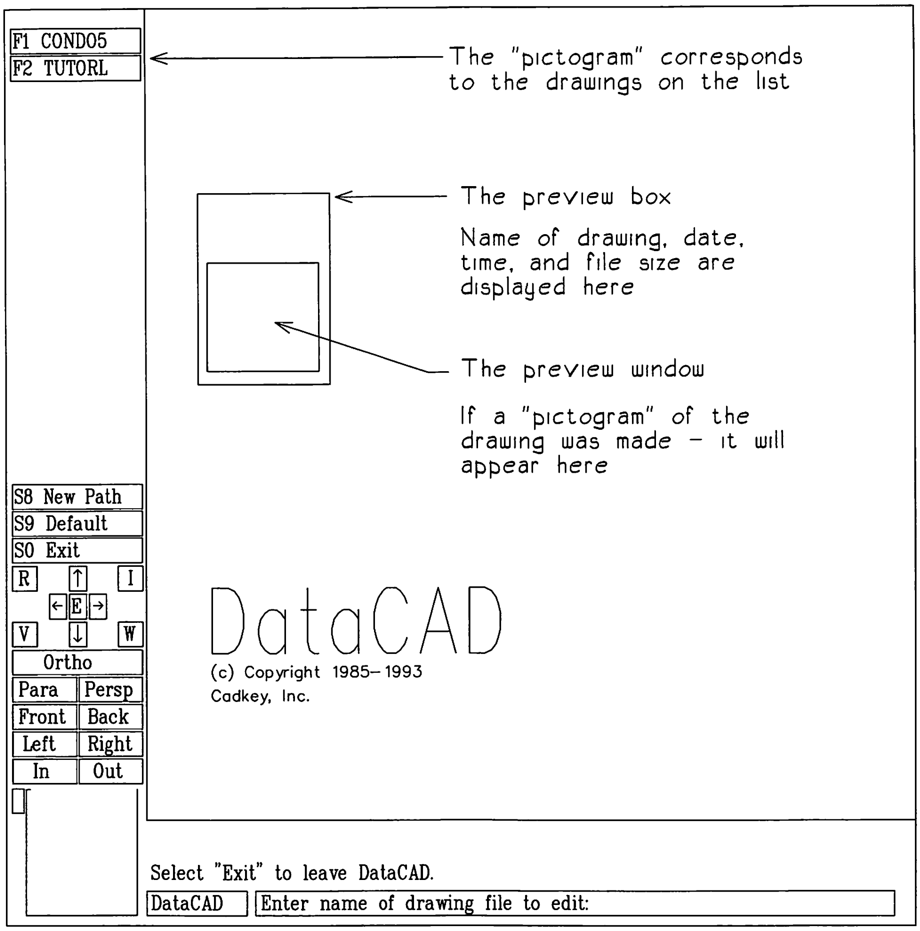
F

1. Hold down the **(Shift)** key.
2. Press **F** on your keyboard. Your drawing will be filed under the name you originally gave it!

Creating a "Pictogram" of your drawing

You can create a small picture of your drawing that can be displayed using the preview box in the DataCAD opening menu. When you start DataCAD and move your cursor to the drawing name in the list, the small picture will appear in the preview *window*, shown in Figure 1.11. DataCAD refers to this as the POF, which means Pixel Output File.

1. Press mouse button 3 until you are in the **Utility** menu.
2. Pick the **File I/O** option. (Files In and Out.)



The "pictogram" corresponds to the drawings on the list

The preview box

Name of drawing, date, time, and file size are displayed here

The preview window

If a "pictogram" of the drawing was made – it will appear here

(c) Copyright 1985–1993 Cadkey, Inc.

Select "Exit" to leave DataCAD.

Enter name of drawing file to edit:

Figure 1.11: The preview box and window.

3. Pick the **PixelOut** option.
4. Pick **Pictogram**.
5. The name of your drawing will appear on the cursor line. Press (Enter) to accept it, so that the name will match your drawing. A file will be created with an extension of **.POF** in the POF directory.
6. Move your cursor out into the drawing area of your screen. A small box will be attached to the cursor. This is the size of the preview window.
7. Place the box over a portion of your drawing that will later help you to visually identify it, as in Figure 1.12.
8. Now press mouse button 3 to exit the File I/O menu.

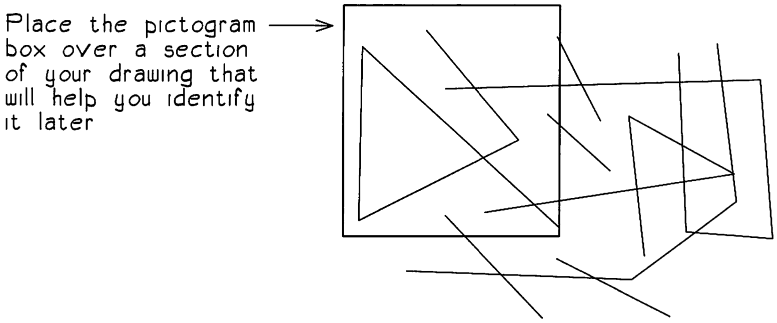

Place the pictogram box over a section of your drawing that will help you identify it later

Figure 1.12: Place the preview window on your drawing.

Leaving Your Drawing

When you are finished with your drawing, you will want to leave it and start a new drawing. Before doing so, you may want to go over this chapter again until you get a good feeling for how the basics of DataCAD work. For example, if you are having a hard time moving your mouse just right, or pressing the right buttons, you will want to practice some more before starting your first project.

Once you feel you are ready, follow these steps:

Use Quick Key!

Alt

N

1. To quickly go to the New Drawing option, you can hold down the **(Alt)** key and press **N**. This is the quick key that allows you to skip these steps:

a) Press mouse button 3 until you are in the **Utility** menu.

b) Pick **File I/O** (drawing files in & out).

c) Pick **New Dwg**. The menu is displayed as shown in Figure 1.10.

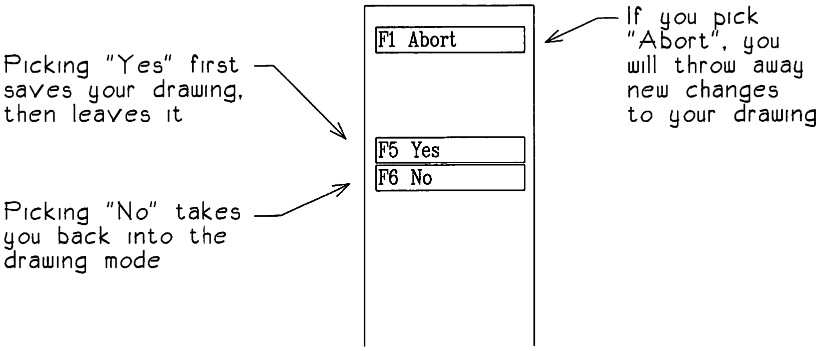

Picking "Yes" first saves your drawing, then leaves it
Picking "No" takes you back into the drawing mode
F1 Abort
F5 Yes
F6 No
If you pick "Abort", you will throw away new changes to your drawing

Figure 1.13: The New Drawing menu.

2. Pick **Yes** to leave this drawing. DataCAD will automatically save your drawing when you use the Yes option! The drawing list will appear with the name of your new drawing.

Previewing your drawing

Now you will be able to see the pictogram you created earlier.

1. Move your cursor over to the name of your drawing you just created, **DRAW1**. *Do not pick it! Just highlight it with your cursor.*
2. Look at the preview window on your screen. Notice the pictogram you defined appears. Also, you will see that the name of the drawing, the date it was last edited, the time, and the size of the drawing all appears in this preview box.

Automatic Save Feature

You may have noticed that your file was "auto-saved" as you were working on it. This probably happened about every 30 minutes. This feature creates a temporary file that allows you to get back your work if you have a power outage. It's a nifty feature to have, but it does not permanently save your file.

After a power outage, the file will appear in the main DataCAD directory as: **filename.asv**.

The only way to *permanently* save your file is to either press capital F during your drawing session, or pick Yes when leaving your drawing.

Chapter Summary

During this chapter you learned the following:

How to start a drawing using a drawing sheet.

There are two main menus, Edit and the Utility.

Mouse button 1 is for picking, button 2 is for object snapping, and 3 is to stop drawing a continuous line - to exit a menu - or to change from the Utility to Edit menu and back again.

You don't have to pick an option to draw. You can draw lines right away.

K is the quick key to change colors.

O turns Orthomode on and off.

Object snap allows you to grab onto items as you are drawing.

E is the quick key to the Erase menu.

Items can be picked to modify by Entity, Group, Area and Fence.

(<) is quick erase.

(Shift) (<) is to quick erase the last group.

(>) is quick restore, sometimes called "unerase".

(Shift) F is the fast way to permanently save your drawing.

The "auto-save" feature is useful if you have a power outage. It creates a temporary file. This file is erased when you leave DataCAD properly.

Arcs and circles are easy to draw and are found in the Curves menu.

Pictograms are easily created for previewing your drawings from the drawing list menu.

(Alt) N takes you to the File I/O, New Drawing menu.

When you pick Yes in the New Drawing menu, DataCAD automatically saves your drawing before leaving it.

CHAPTER 2

Laying Out Walls

Now that you have played a little with DataCAD, you are ready to start a real project. This project is a small condominium in a retirement community. The plot scale will be 1/4" = 1'-0".

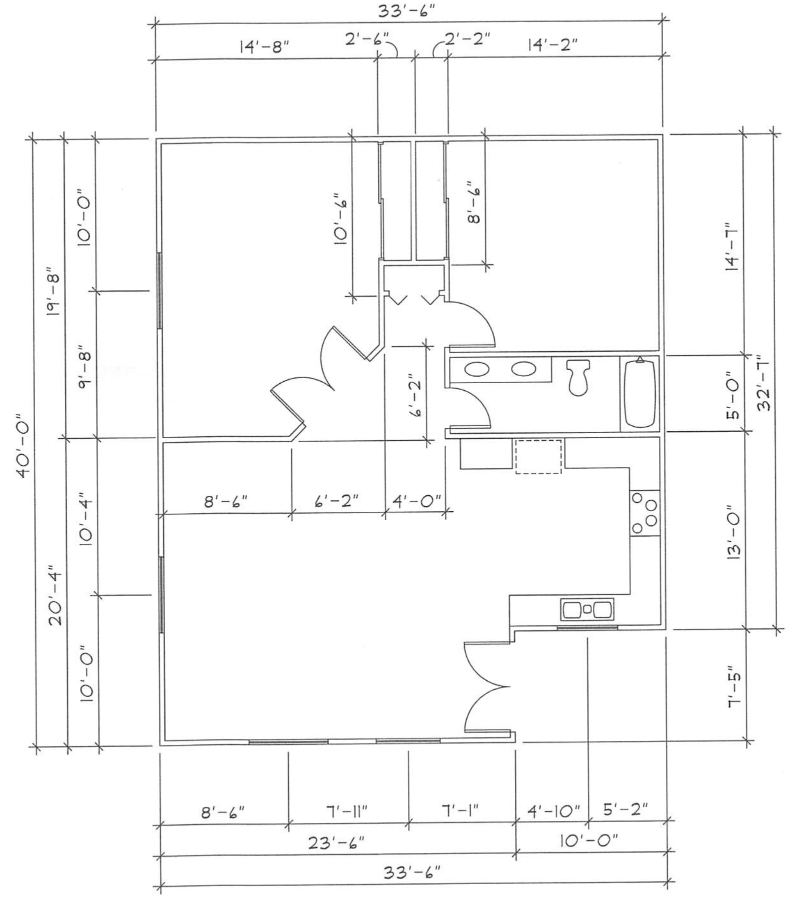


Figure 2.1: The condominium project.

In order to begin your project, you need to use the drawing sheet called PLAN_1-4.

1. Start DataCAD, if applicable, by typing in **rundcad** and pressing (Enter).
2. Pick **Default**. (Remember, this option allows you to pick a default scaled drawing sheet for your drawing.)
3. Pick **PLAN_1-4**.
4. Type in the new name for your drawing: **condo1** and press (Enter). The blank drawing sheet will be displayed.

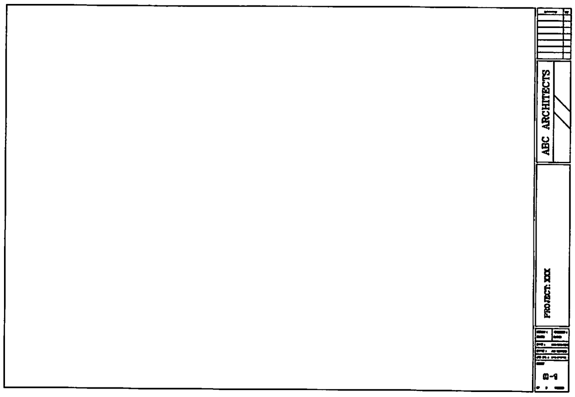


Figure 2.2: The 1/4" drawing sheet.

Layering Your Drawing

As you create the walls, windows, doors, and put together electrical and foundation layouts, etc., you will want items separated onto different layers. This way, you can turn on and off the layers as needed. For instance, you can turn on the layers having the floor plan and the electrical components, and turn off unnecessary layers for an electrical layout, such as the roof and the structural layers. Then you may continue to work on just the electrical or create a plot.

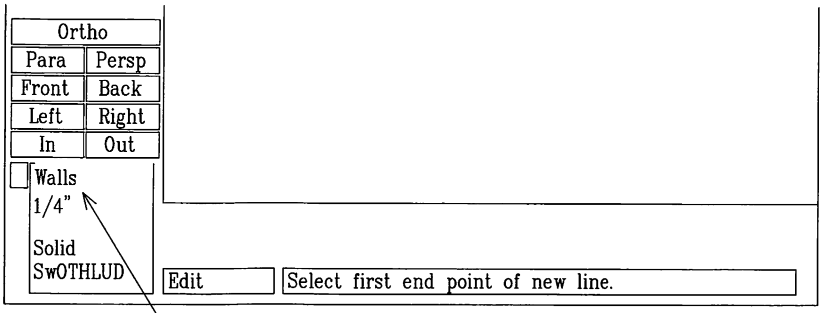
In other words, you can create all of the production sheets necessary for your project in one drawing.

The drawing sheet you are using has many layers already in it and you can create more. Some drawings may have 30 or more layers in them! To see the layers already in your drawing, you can simply press the [Tab] key.

Use Quick Key!

Tab

1. Look at the status area of your screen, as shown in Figure 2.3. Notice that the layer name displayed is **Walls**.
2. Press the **(Tab)** key on your keyboard.
3. Look at the status button area of your screen. Notice the layer now says: **Doors**. Pressing **(Tab)** takes you forward through the layer list.
4. Continue viewing the layer names by pressing the **(Tab)** key. There are about 9 names on the layer list.



Select first end point of new line.

The active layer name appears here

Figure 2.3: The current layer name is displayed.

Use Quick Key!

Shift

Tab

5. Try pressing **(Shift) (Tab)**. Notice that layer names now go backwards through the layer list. You can use this technique to backup to a layer.

The current name displayed is your *active* layer. The active layer is where items (lines, walls, notes, etc.) will be drawn on. When you are drawing walls, you will want them on the Walls layer.

1. Press **(Tab)** until the active layer is **Walls**.

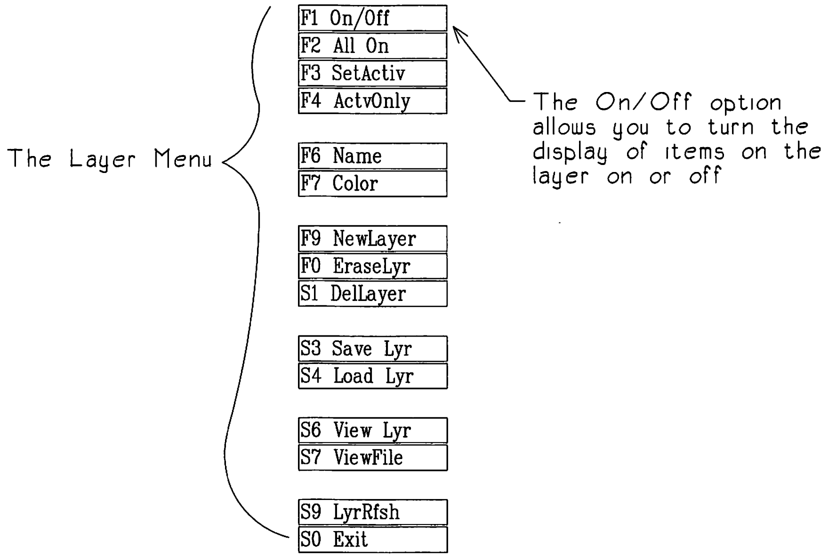
The Layers menu

You can also view all of the layer names by using the Layer menu.

Use Quick Key!

L

1. Use the quick key by pressing **L** on your keyboard, or pick **Layers** from the Utility menu. The Layers menu is displayed.



The Layer Menu

The On/Off option allows you to turn the display of items on the layer on or off

Figure 2.4: The Layer menu.

2. Pick **On/Off**. Now you will see the entire list. Notice that one layer name is displayed in green. This is the "active" layer. You will also see that the function keys numbers that correlate to the layer names are green. This means they are

displayed, or "on". If they are turned off, the function key number will be red.

3. Press mouse button 3 to exit the menu.

Drawing Walls

To draw walls, you will use the Architect menu. This menu also contains the options to draw windows and doors.

Use Quick Key!

A

1. Press **A**, or pick **Architct** from the Edit menu. Do not have the Caps Lock on, or the A key will not take you to Architct. If the Caps Lock was on, simply turn it off and press A again.

Note: *When you begin to learn DataCAD and are following this book, you will want to keep the Caps Lock OFF, unless you are typing in notes. Many keys work differently when Caps Lock is on.*

---

2. Pick the **Walls** option until it is green.
3. Pick the **Width** option. This allows you to adjust the size of your walls.
4. Pick the **4**" option. Notice that 0.4 is automatically typed in for you in the message area. Press (Enter) to accept the value.

   If you wanted to type in your own value from the keyboard, use the following format:

   .6 = **6"**

   .6.1/2 = **6 1/2"**

   1 = **1'-0"**

   1.6 = **1'-6"**

   ..1/2 = **1/2"**

You will start drawing the exterior walls first. Since they are dimensioned from the "sides" (from corner to corner verses the center of the walls), you will want to make sure the option Sides is active.

5. Pick **Sides** until it is green.

Now you are ready to begin drawing your walls. Figure 2.5 shows the exterior walls you will be drawing.

Notice that there is a white dot on the screen. This is called a snap point. To assure that your plan will properly position on the sheet, you can use this as a start point. Later, when you draw your own plan, you do not have to snap to this point. It will not plot or print.

1. Move your cursor out into the lower left corner of the drawing area and place it on the white snap point.
2. Object snap to the point by pressing mouse button 2. This will start your wall line.

3. Move the cursor over to the right. Notice the X and Y readouts in the coordinate line. The X indicates a horizontal measurement (across the screen), while the Y indicates a vertical measurement (up and down).

Draw the exterior walls first

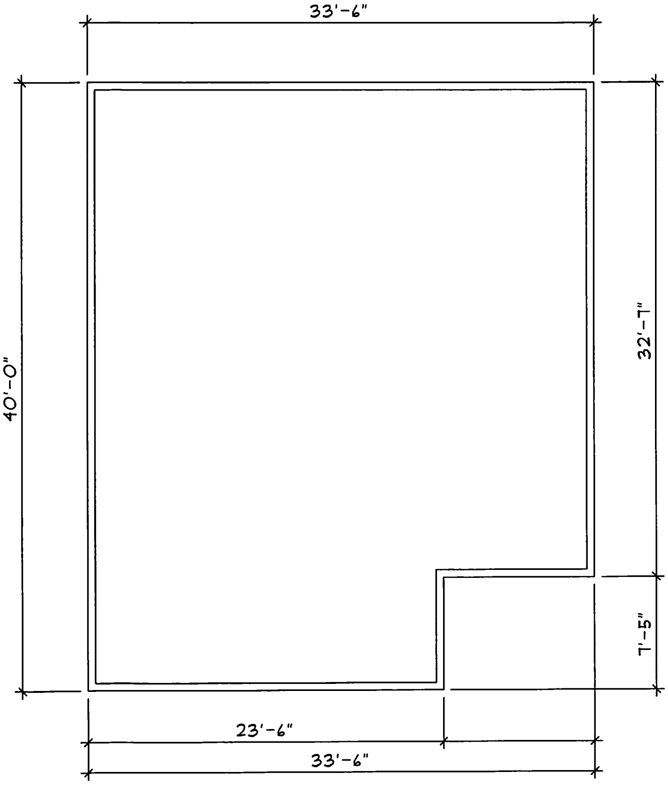
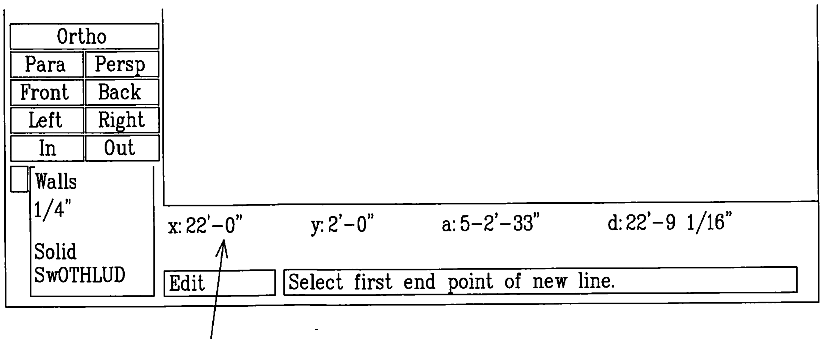


Figure 2.5: The exterior walls.

4. The first wall you draw will be the 23'-6" wall in the front of the house. Using the coordinate readout, as shown in Figure 2.6, move your cursor to the right to measure the length of your wall. The coordinates should read: **X: 23'-6"** **Y: 0'-0"**.



x: 22'-0" y: 2'-0" a: 5-2'-33" d: 22'-9 1/16"

Select first end point of new line.

The X and Y coordinates correspond to your cursor movement

Figure 2.6: Using the coordinate readout.

5. Pick with mouse button 1 (pick 2 in Figure 2.7). This will be the outside of your wall. Notice the message now says: Select a point to define the other side of the wall.

6. Move your cursor up, into what will be the inside of your house. Pick with mouse button 1 (pick 3 in Figure 2.7). Your wall will be drawn.

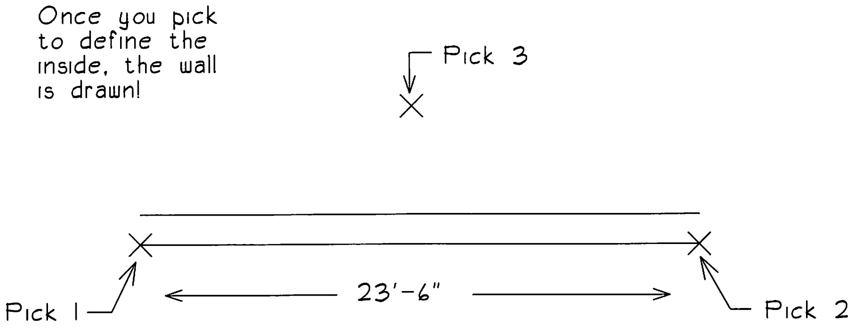


Figure 2.7: Drawing the first wall.

Drawing the next wall

1. Move your cursor up vertically to measure the next wall. The coordinates should read: **X: 0'-0" Y: 7'-5"**.
2. Pick to draw the next end of your wall. (Pick 1 in Figure 2.8.)
3. Move your cursor over to the left, and pick to draw the inside of your wall. (Pick 2 in Figure 2.8.)

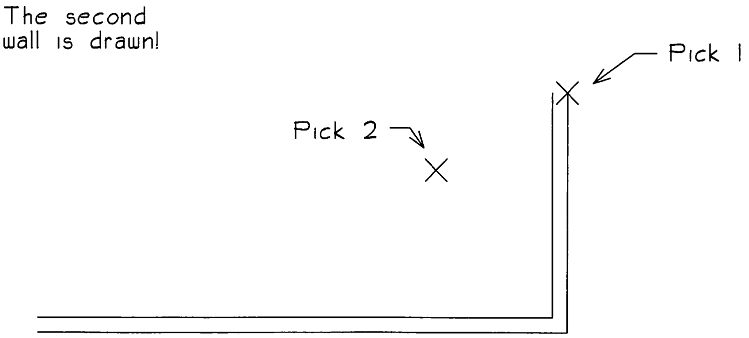


Figure 2.8: Drawing the second wall.

Windowing

While you are drawing your projects, you will want to be able to easily move your view in and out, over to the left, right, up and down. This can be done while you are drawing by using the arrow keys and the page up and down keys.

Getting a closer view

For example, you may want to get closer to your house in order to see your wall better. Follow these steps:

Use Quick Key!

Page Down

1. Press **(Page Down)** on your keyboard. Your wall will get closer.
2. Press **(Page Down)** again until you are close enough to see both sides of the wall comfortably.

The Window Control Keys on your keyboard

These keys can be used at any time while you are drawing (except when you are in the type-in mode, such as typing in text for a room label).

← The left arrow moves your view to the left, as though you actually stepped over to the left.

→ The right arrow moves your view to the right, as though you stepped over to the right.

↑ The up arrow moves your view up, as though you actually took a step up.

↓ The down arrow moves your view down.

Page Up The Page Up key moves your view out further from your drawing. Your drawing appears smaller.

Page Down The Page Down key moves your view in closer to your drawing. Your drawing appears larger.

Home The Home key centers your view. Hold your cursor on the part of your drawing you want in the center of your screen and press Home.

Try using these keys.

Use Quick Key! Page Up

1. Press **(Page Up)**. Does your drawing appear smaller?
2. Press the **(right arrow)** key. Did your view move to the right as though you stepped over to the right? Your drawing, then, moved left?

Use Quick Key! →

3. Hold your cursor over to the left part of your drawing and press the **(Home)** key. Notice how this area is now moved to the center of the screen.

Use Quick Key! Home

The windowing buttons in the control panel

Their are buttons in the control panel that you can use too! Try picking them to see what they do for you.

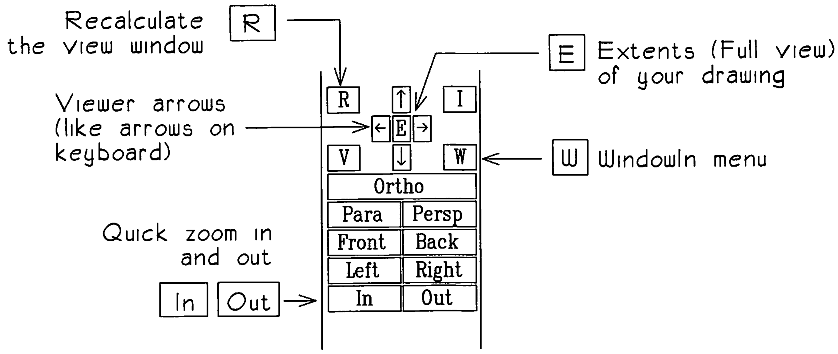

Recalculate the view window
R
Viewer arrows (like arrows on keyboard)
Quick zoom in and out
In
Out
E Extents (Full view) of your drawing
W WindowIn menu
R
I
E
V
W
Ortho
Para
Persp
Front
Back
Left
Right
In
Out

Figure 2.9: The window keys in the control panel.

1. Pick the **R button** in the control panel (**R**ecalculate the full window extents). The full view of the drawing will be displayed. This button can be used anytime you wish to see the entire drawing.
2. Pick the **W button** in the control panel (**W**indow In). Now you will be in the Window In menu.
3. Define a small box on the screen to "zoom" into, by picking two diagonal points, as shown in Figure 2.10.

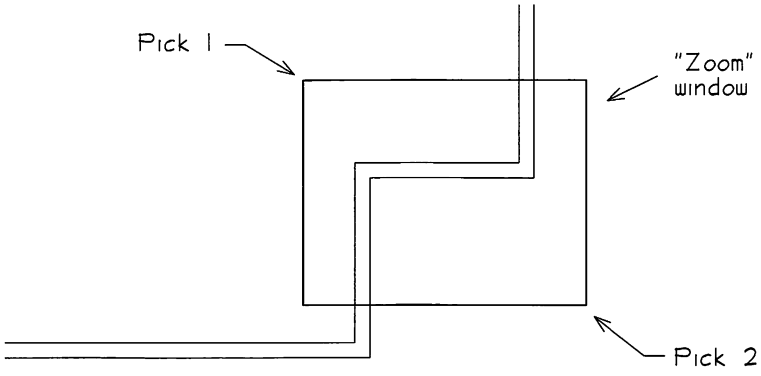


Figure 2.10: Two diagonal picks define a "zoom" window.

4. The area you picked will be enlarged for viewing on the screen.
5. Press mouse button 3 once to exit this menu. Your line should still be connected to the walls you drew.
6. Pick the **E button**. A full window extents will be displayed.

Drawing more walls

1. Use the window keys or buttons to get a comfortable view of your walls.
2. If you disconnected from your walls by accident, use mouse button 2 to object snap back to the outside end of the last wall you drew, as shown in Figure 2.11.

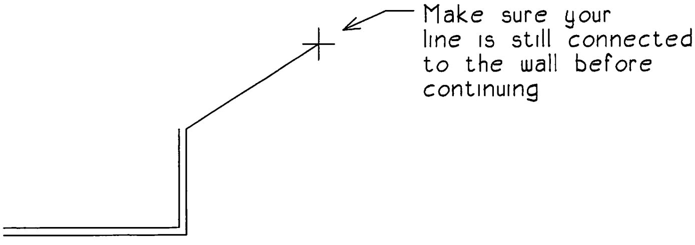

Make sure your line is still connected to the wall before continuing

Figure 2.11: Make sure your line is connected before continuing.

3. Now move your cursor to the right to draw the 10' wall. The coordinates should read: **X: 10'-0"** **Y: 0'-0"**.
5. Pick with mouse button 1 to define the end of the wall.
6. Move your cursor up and pick to define the inside of the wall.

Typing in Measurements

You can quickly and accurately type in the measurements of your walls. This way, you can avoid little mistakes that may occur when you move your mouse a little while picking, or type in measurements that require more precision. This is done by using the X,Y coordinate directions, relative to the last point.

1. In order to identify which direction you will be using (X or Y), move your cursor up as if you were going to pick the length of your next wall. Notice the coordinates read a **Y** direction value. This is the direction you will use to type the measurement of the wall.
2. Press the **(Spacebar)**. A message will appear for you to type in the relative X distance (length) of your wall.
3. Press (Enter) to accept the value of 0 in the X direction.
4. Now you are asked to type in the Y distance. Type in: **32.7** and press (Enter) for the length of 32'-7". The outside of your line will be drawn.
5. Move your cursor over to the left to define the inside of the condo, and pick with mouse button 1. The inside wall will be drawn, as shown in Figure 2.12.

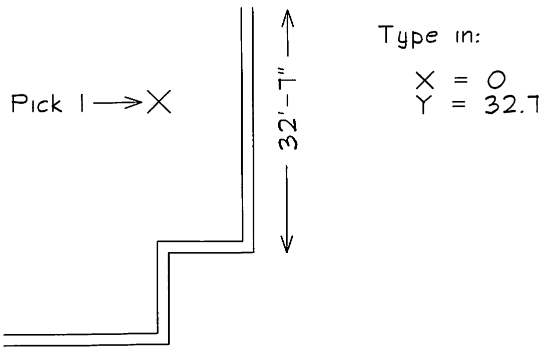


Figure 2.12: The wall is drawn by typing in the measurement.

6. Move your cursor to the left as if you were going to pick the length of your next wall. Notice the coordinates read a *minus* X direction (**-X**). A minus value, then, allows you to define a left direction.
7. Press the **(Spacebar)** again. This time type in a **-33.6** for the X distance and press (Enter).
8. Press (Enter) again to accept a **0** value in the Y direction. The outside length of your wall will be drawn.
9. Move the cursor down and pick to define the inside of the wall.
10. Move your cursor down as if you were going to pick the length of your next wall. Notice the coordinates read a *minus* Y direction (**-Y**). A minus Y value allows you to define a down direction.
11. Press the **(Spacebar)** again. Press (Enter) to accept a **0** value in the X direction.
12. Type in a **-40** for the Y direction and press (Enter). The outside of the wall will appear.
13. Move the cursor to the right and pick to define the inside of the wall. Your exterior walls are finished! (Figure 2.13)

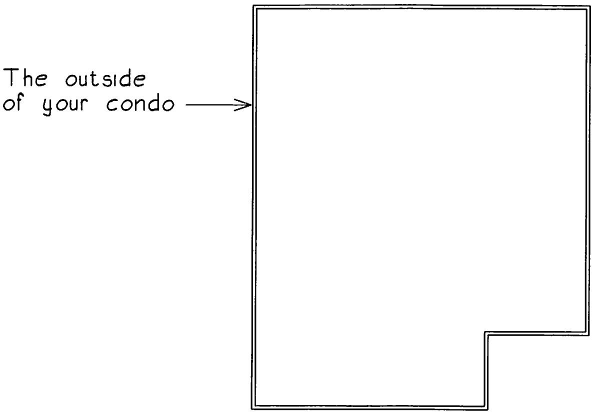


Figure 2.13: The exterior walls are complete.

SWOTHLUD

Notice the word SWOTHLUD which appears in the status button area of your screen. This is an acronym which each letter stands for something. As an example, the W stands for Walls. Small w means walls are off and you are drawing lines, while capital W means wall are on.

All of the letters in SWOTHLUD should be capitalized at this point. The rest of the letters stand for:

S = grid **S**nap On/Off - small **x** key
W = **W**alls On/Off - Walls in Architct menu or [=] key
O = **O**rtho mode On/Off - **O** key
The rest are found in the Display menu:
T = **T**ext is displayed

H = Hatch is displayed
L = Lineweights (thicknesses) are displayed
U = User linetypes are displayed
D = Dimensions are displayed

Drawing the interior walls

Drawing the interior walls is an easy process. You draw them just like the exterior walls, but interior walls are usually measured, or dimensioned, off another wall, either an exterior or another interior wall.

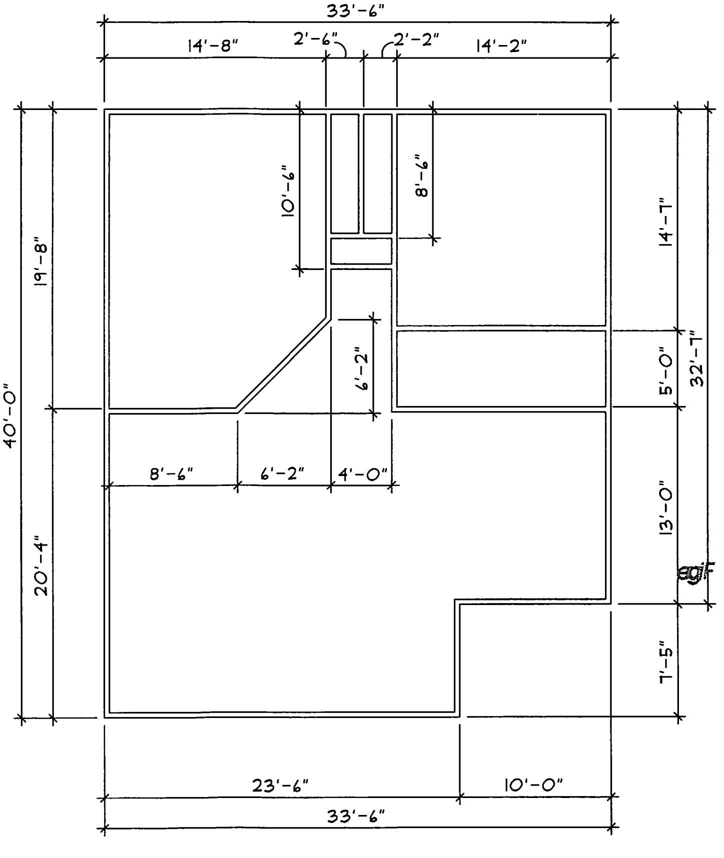


Figure 2.14: The interior walls of the condo.

In other words, you will want to reference a corner of an existing wall and measure from it to start your inside walls.

Measuring off an existing wall

In order to reference a corner, you must turn the corner X and Y value to zero. This can be done in two ways. One way is to use the "reference key" and the second way is to object snap to the corner and quit. Both ways will turn a point to zero so that you can measure from it.

Use Quick Key!

~

1. Press the **(~)** key. The message should say: Select reference point.
2. Hold the cursor to the upper right corner of your condo wall (shown in Figure 2.15), and press the mouse button 2 to object snap to the corner.

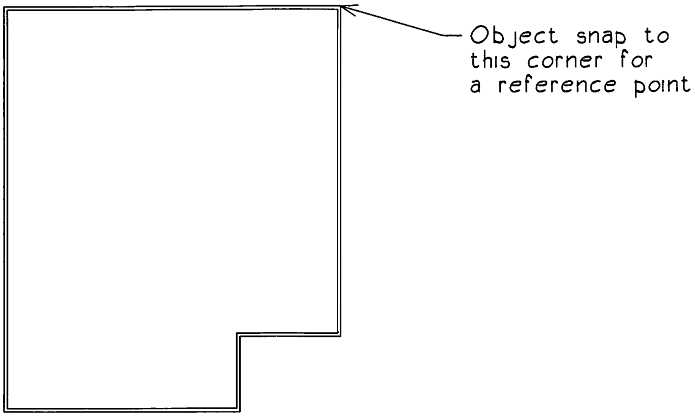


Figure 2.15: Referencing a corner.

3. Hold your cursor over the corner again and look at the X Y coordinates. Do they read 0? If not, try again.
4. Move your cursor to the left. Notice how you can measure from that corner.
5. Press the **(Spacebar)**.
6. Type in **-14.2** for the **X** value and press (Enter).
7. Press (Enter) again to accept **0** in the **Y**. Notice how your line is connected in the appropriate place, as shown in Figure 2.16, step 1.
8. Press the **(Spacebar)**.
9. Press (Enter) to accept **0** in the X.
10. Type in **-19.7** for the Y and press (Enter).
11. Pick to the left to create the other side of the wall, as in Figure 2.16, step 3.
12. Then, pick to define the end of the last wall, crossing over the right-most wall, as shown in Figure 2.16, step 4.
13. Move your cursor down to define the other side of the wall, step 5.
14. Press mouse button 3 to end the wall.

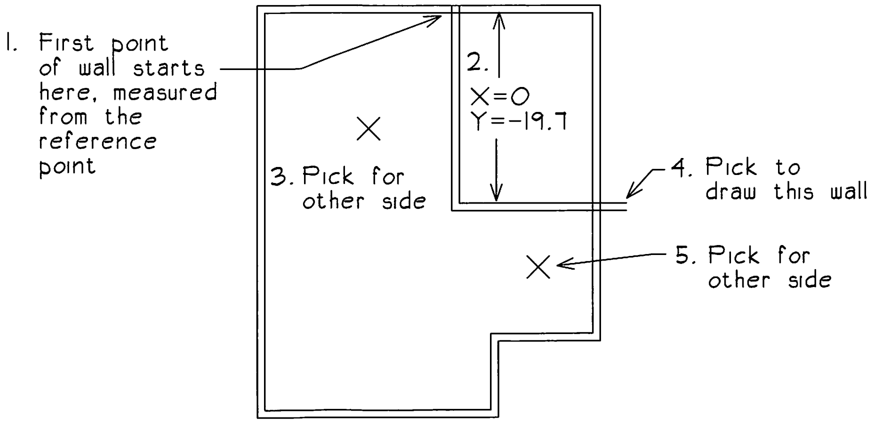

1. First point of wall starts here, measured from the reference point
2.
X=0
Y=-19.7
3. Pick for other side
4. Pick to draw this wall
5. Pick for other side

Figure 2.16: Drawing an inside wall.

Creating the bathroom wall

Use Quick Key!

~

1. Reference the same corner, by pressing the **(~)** key and object snapping (press mouse button 2), to the same upper right corner of your condo. (See Figure 2.17, step 1.)
2. Press the **(Spacebar)**.
3. Press (Enter) to accept a X distance of **0**.
4. Type in **-14.7** for the Y distance and press (Enter).
5. Move your cursor to the left until it crosses the hall wall, as in Figure 2.17, step 3. Pick to define the end.
6. Move your cursor up and pick to indicate the other (undimensioned) side of the wall, as in Figure 2.17, step 4.
7. Press mouse button 3 to end the wall.

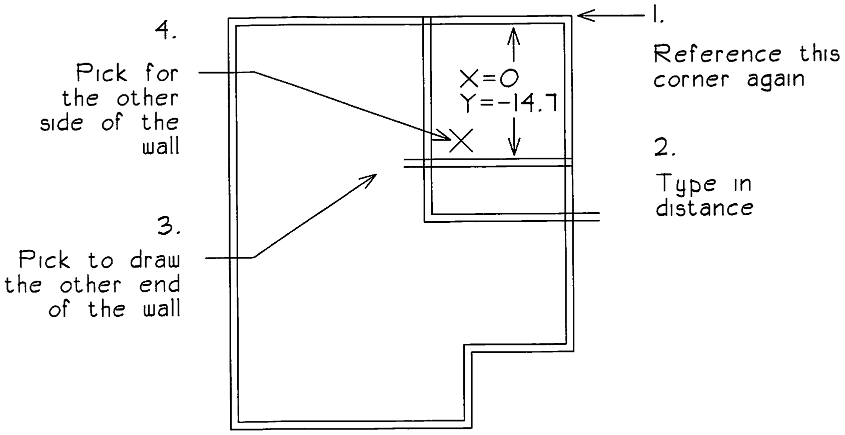

4.
Pick for the other side of the wall
3.
Pick to draw the other end of the wall
X=0
Y=-14.7
1.
Reference this corner again
2.
Type in distance

Figure 2.17: Creating the next wall.

Creating the master bedroom walls

You will draw the interior walls for the master bedroom the same way and use the orthomode drawing aid to create the angled wall.

Use Quick Key!

~

1. Press the reference **(~)** key and object snap (mouse button 2), to the upper left corner of your condo, as in Figure 2.18. This will set that corner to zero.
2. Press the **(Spacebar)**.
3. Type in **14.8** for the **X** value and press (Enter).
4. Press (Enter) to accept 0 in the Y. Is your wall connected in the correct spot? (See Figure 2.18)
5. Now, simply move your cursor down and pick to create a vertical wall, as in Figure 2.18. Don't worry too much about the length, as you will fix it up later when you are cleaning up the wall intersections.
6. Move your cursor to the right and pick to define the other side of the wall.
7. Once this wall is created, press mouse button 3 to quit the line.

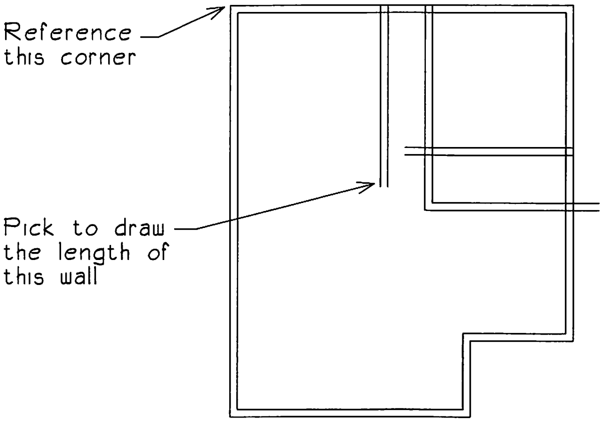


Figure 2.18: Creating the first wall for the master bedroom.

Use Quick Key!

~

8. Press the reference key **(~)** and object snap back to the upper left corner, as in Figure 2.19.
9. Press the **(Spacebar)**.
10. Press (Enter) to accept a **0** in the X.
11. Type in **-20** in the Y and press (Enter). Your line should be started in the correct spot.
12. Press the **(Spacebar)** again.
13. Type in **8.10** for the X distance, and press (Enter).
14. Press (Enter) to accept a **0** in the Y direction. The first line of your wall will appear.
15. Move your cursor up to the inside of the master bedroom and pick to define the other side of your wall.

Use Quick Key!

O

16. To draw the angled line, simple move your cursor up and to the right so that your line locks in a 45 degree angle. If Orthomode is NOT on (SW**o**THLUD), press **O** until the message reads: Orthomode is ON. Now your line should be locked on an angle.
17. Overlap the first line of the master bedroom and pick, as shown in Figure 2.19.

18. Move your cursor to the left and pick to define the other side of the wall. Your condo should look like Figure 2.19.
19. Press mouse button 3 to end the wall.

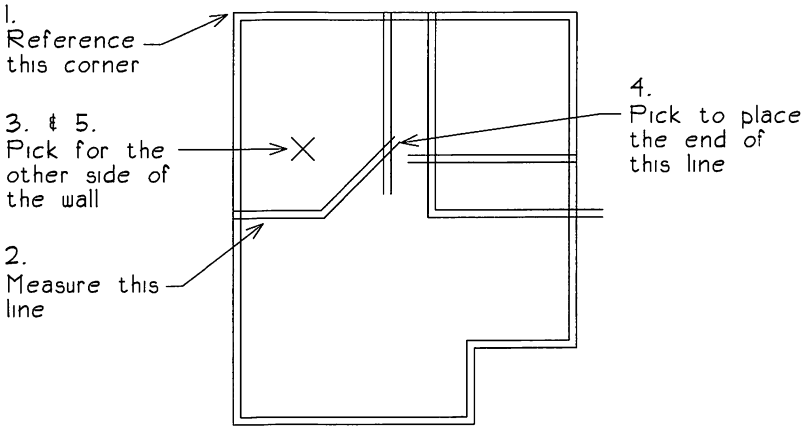

1.
Reference this corner
3. & 5.
Pick for the other side of the wall
2.
Measure this line
4.
Pick to place the end of this line

Figure 2.19: Your condo should now look like this.

The Closets

You need to add a few more walls to complete the closet area.

Use Quick Key!

~

1. Press the reference key **(~)** and object snap to the intersection indicated in Figure 2.20, using mouse button 2.
2. Press the **(Spacebar)** to invoke relative coordinate input.
3. Press (Enter) to accept **0** in the X distance.
4. Type in **-8.6** for the Y distance, and press (Enter). Is the line starting in the correct spot?

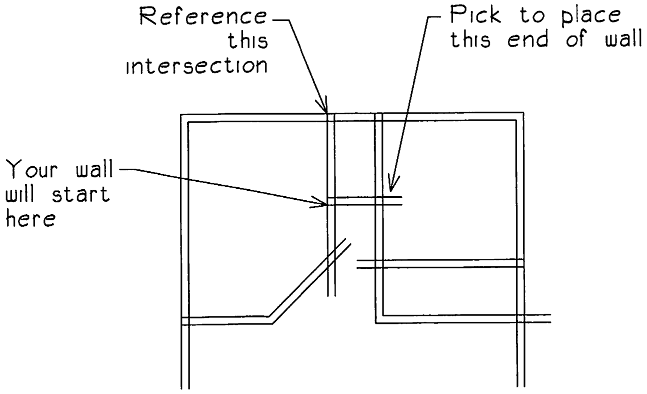

Reference this intersection
Pick to place this end of wall
Your wall will start here

Figure 2.20: Drawing the closet walls.

5. Move your cursor to the right to draw the line and pick with your mouse button 1. Of course, you still want the Orthomode on (SWOTHLUD) when you are picking straight lines.
6. Place your cursor above this line and pick to indicate the other side of the wall.
7. Quit this line by pressing mouse button 3.

8. Since the end of this wall was your last point, which means the end has a **0** value, just press the **(Spacebar)** to invoke relative coordinate input.
9. Press (Enter) to accept **0** in the X distance.
10. Type in **-2** for the Y distance, and press (Enter). Your line should now be connected in the correct spot.
11. Move your over to the left to draw a horizontal wall, and pick with mouse button 1, as in Figure 2.21.
12. Place your cursor above this line and pick to indicate the other side of the wall. You drawing should look like Figure 2.21.
13. Press mouse button 3 to end the wall.

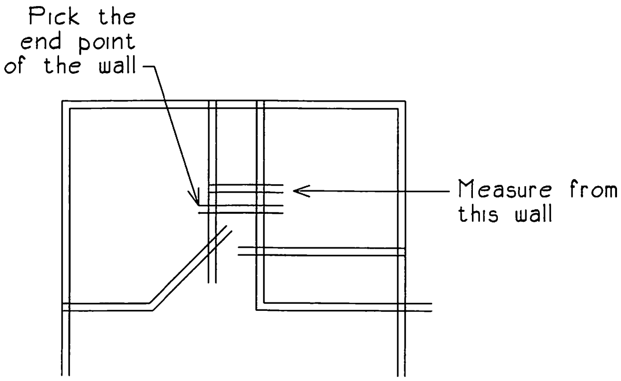


Figure 2.21: Your drawing should resemble this.

Adding the last wall

Use Quick Key!

~

1. To draw the last wall which separates the closets, press the reference key **(~)**, and object snap (mouse button 2) to the intersection of the closet wall and the bedroom wall, as shown in Figure 2.22.
2. Press the **(Spacebar)** to invoke relative coordinate input.
3. Type in **2.6** for the X distance, and press (Enter).
4. Press (Enter) to accept **0** for the Y distance. Your line should now be connected in the middle of the closet.
5. Move your cursor down to draw the vertical wall, as shown in Figure 2.22, and pick with mouse button 1.
6. Place your cursor to the left of this line and pick to indicate the other side of the wall.
7. Press mouse button 3 to quit drawing the wall.
8. Press **(Shift) F** to file your drawing.

Use Quick Key!

Shift

F

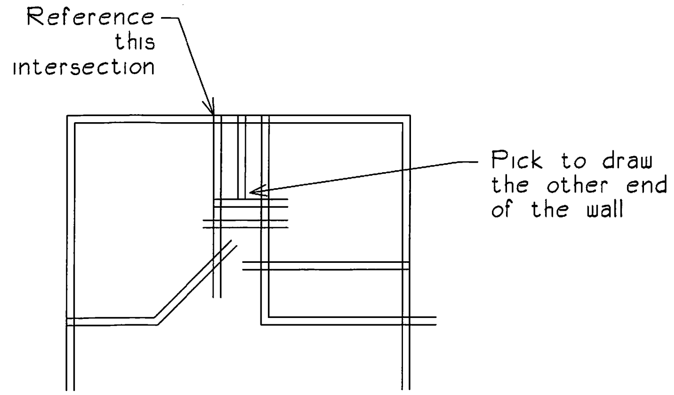

Reference this intersection
Pick to draw the other end of the wall

Figure 2.22: All of the walls are drawn !

Turning On and Off Grid Pick

You may have noticed that your cursor, as you move it in the drawing area, "bounces" to one inch intervals, or increments. This is very important when you are measuring using the X and Y coordinate readout. The term for this "bounce" is *grid picking* or *grid snap*. In the next steps, you will want to turn off the grid snap in order to make it easier to move your cursor around. The quick key to do this is the X.

Use Quick Key!

X

1. Press the **X** key on your keyboard. A message is displayed: Snapping is OFF. Move your cursor and notice the X and Y readout. You will probably see fractions show up. The S in SWOTHLUD will appear small (**s**WOTHLUD).

   (This snap has nothing to do with object snapping. Grid snap is mouse button 1, while object snap is mouse button 2.)

2. Press the **X** key on your keyboard again. A message is displayed: Snapping is ON. What do your coordinates say now? As you can see, when you are drawing lines you should have your grid pick on so that your lines are more accurate (**S**WOTHLUD).

3. Finally, press the **X** key on your keyboard again. A message is displayed: Grid Snap is OFF (**s**WOTHLUD). Leave your grid snap off for now.

Cleaning up the intersections

Once all of your walls are created, you will want to clean up the intersections. DataCAD has automatic clean up options for three kinds of intersections. They are shown in Figure 2.23. The menu that has these options is called Cleanup and is found in the Edit main menu.

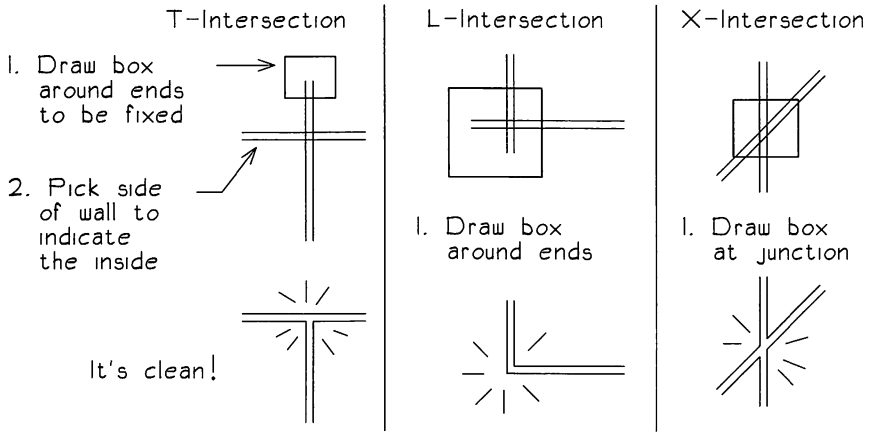


Figure 2.23: T, X, and L intersection examples.

1. Press mouse button 3 until you are in the Edit menu.
2. Pick the option called **Cleanup**.
3. Pick the **T Intsct** option.
4. Pick two points to form a box surrounding the two endpoints of a T intersection, as shown in Figure 2.24.
5. Now pick the line that indicates the inside wall, as shown in Figure 2.24. If you have done this right, the intersection will be cleaned!

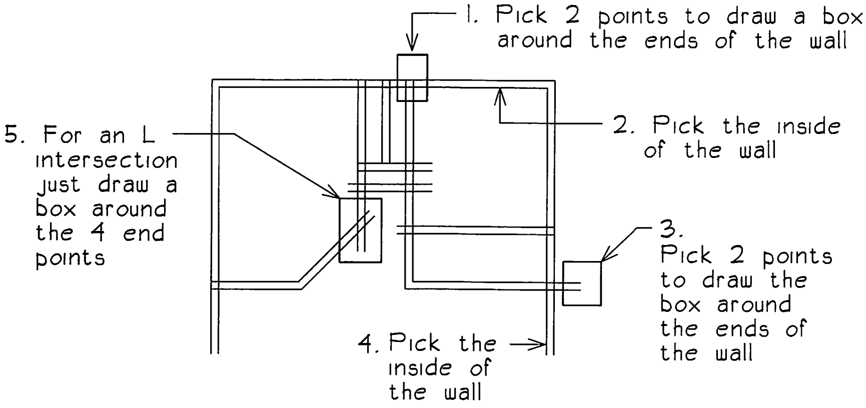

1. Pick 2 points to draw a box around the ends of the wall
2. Pick the inside of the wall
3. Pick 2 points to draw the box around the ends of the wall
4. Pick the inside of the wall
5. For an L intersection just draw a box around the 4 end points

Figure 2.24: The correct way to clean up a T intersection.

6. Clean the rest of your T and L intersections, as shown in Figures 2.23 and 2.24. Your drawing should look like Figure 2.25.

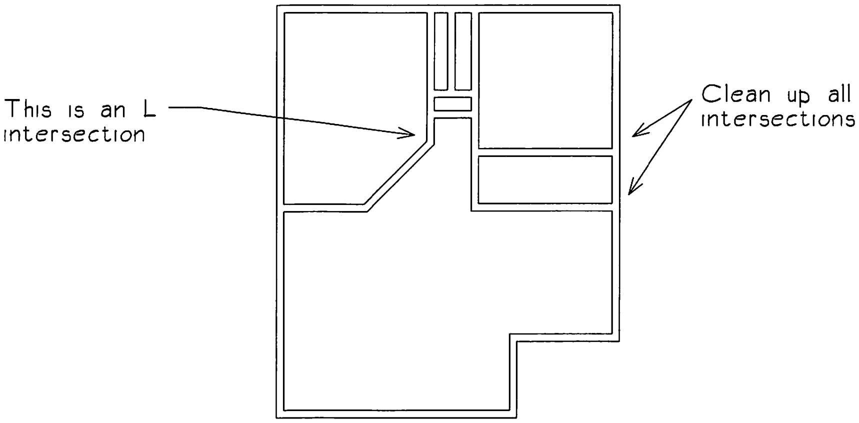


Figure 2.25: The intersections are cleaned.

Welding wall lines back together

If you make a mistake when indicating the side of the wall to clean your T intersection to, and pick the outside instead of the inside, the outside wall will get a hole in it. This is shown in Figure 2.26. To repair the hole, you will "weld" it back together, then try the T intersection again.

Use Quick Key!

Alt

W

1. Press **(Alt) W** to go to tne Weld line option, found in the Cleanup menu.
2. Pick the first part of the line that has a hole in it, as shown in Figure 2.26, step 1.
3. Pick the second part of the wall, as shown in Figure 2.26, step 2. The wall will weld together.
4. To continue cleaning up the T intersection, exit the menu and return to the Cleanup menu by pressing mouse button 3 once.
5. Pick the **T Intsct** option and clean up the intersection, making sure this time you pick the *inside* of the wall to clean to.

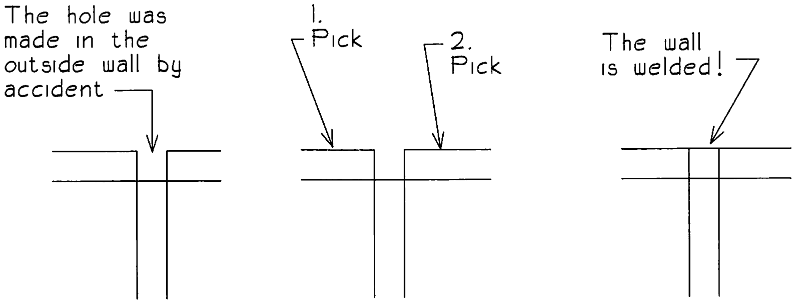


Figure 2.26: The wall is welded.

Drawing your own floor plan

When you have completed this floor layout, you may want to try your new skills on your own floor plan! Remember to draw the exterior walls first, then draw the interior walls (if possible).

If you feel you need more practice before trying to draw your own floor plan, you can go through this project one more time so that you are well acquainted with the wall drawing features of DataCAD.

Once you feel comfortable with drawing walls and cleaning intersections, continue onto the next chapter, where you will add doors and windows!

During this chapter, you learned:

Default drawing sheets help start a new drawing.

The (Tab) key is used to change active layers.

To draw walls and define a wall width.

How to use the coordinate display.

Pressing the (Spacebar) invokes coordinate input mode (type in distances).

Relative Cartesian input allows you to type in X and Y distances.

The reference key (~) is used to measure from an existing corner point when placing interior walls.

Using the middle mouse button to object snap is very valuable when defining a reference point.

SWOTHLUD is a status line that helps you know when certain options are active, such as Orthomode, Walls or Grid Snap.

Wall intersections are easy to clean using the Cleanup menu.

CHAPTER 3

Doors and Windows

Once you have drawn in your walls, you can start adding doors and windows. Notice the door and window locations in your floor plan, shown in Figure 3.1.

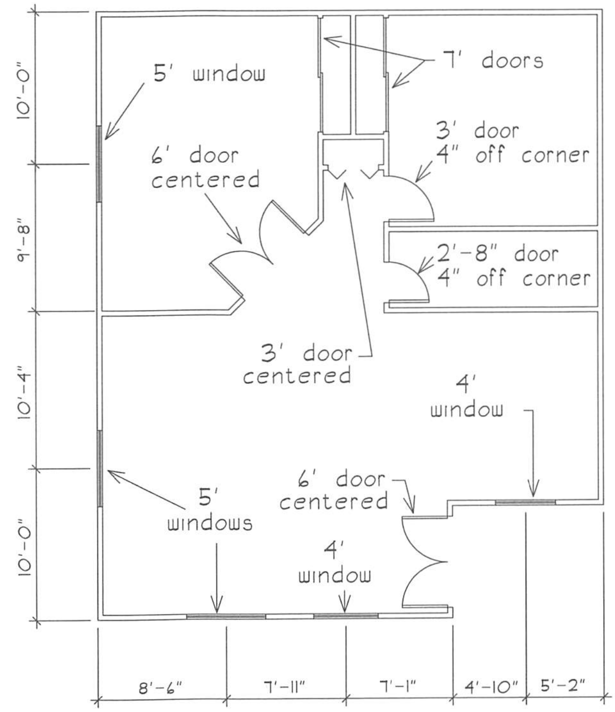


Figure 3.1: The door and window locations in the condo.

Turning on Draw Marks

When adding doors and windows, it is a good idea to turn on your draw marks. Draw marks are little stars that appear anytime you pick on the drawing area of your screen. They are a drawing aid, as they help you visually check exactly where you referenced and where your door will go.

Draw marks are temporary and will disappear when you press the [Esc] (escape) key.

1. Press mouse button 3 until you are in the Utility menu.
2. Pick the **Settings** option.
3. Pick **DrwMarks** until the option is active (function key number turns green).

Drawing Doors

The options for adding doors, windows, and even wall cutouts are found in the Architect menu.

Use Quick Key!

A

1. Press **(Tab)** to go to the **Doors** layer.
2. Press **A** to go into the Architect menu. (Remember to keep Caps Lock off when using quick keys.)
3. Pick **DoorSwng**.

Doors are created with 4 points, as shown in Figure 3.2:

1. The hinge location
2. The other side, or strike side, which defines the width of the door
3. The swing direction (in or out of the room)
4. The outside of the doorway, which places the dimension point.

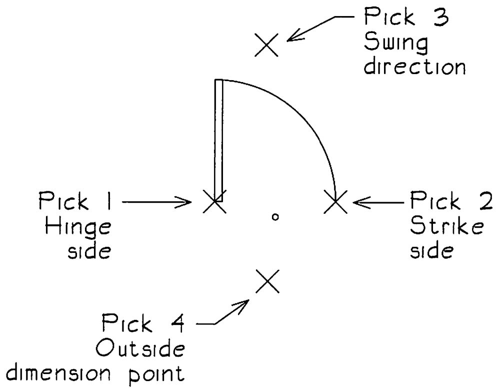


Figure 3.2: The steps in making a door.

When inserting the door in a wall, the typical door, which is defined by its sides, is measured from a corner. This measurement allows for a framed opening. For this exercise, you will use a distance of 4" from the corner.

A corner is referenced and then measured from that point. The hinge side is then established. The strike side is measured, indicating the width of the door. Then the swing direction is picked, typically inside the room. To finish, the opposite side to the strike is picked, which aligns the dimension point (center point of the door) with the outside wall. See Figure 3.3.

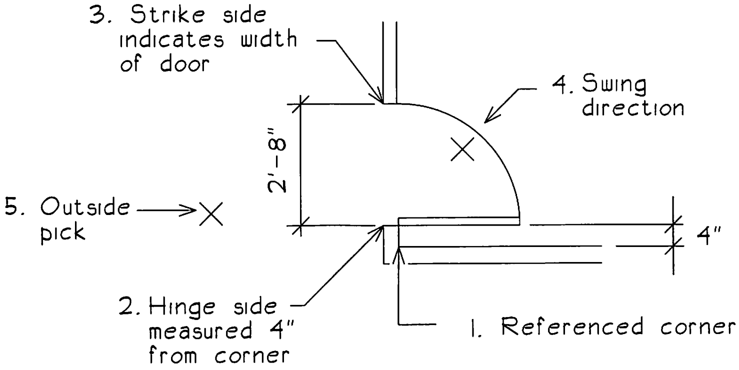

3. Strike side indicates width of door
4. Swing direction
2'-8"
5. Outside pick
4"
2. Hinge side measured 4" from corner
1. Referenced corner

Figure 3.3: Inserting a door in the wall.

Making the bathroom door

1. The first door you will draw is the bathroom door. This is a single door, so make sure that the **Single** option is active (green).
2. You will locate the door by the hinge side and the strike side, so make sure **Sides** is active (green).

When you insert the door, you want a "wall" opening cut and ends drawn in the opening. To ensure that the proper layer is being used to search for your walls, you will set it in the LyrSrch option.

***Note:** In other menus, LyrSrch will search **all** other displayed layers. In the Architect menus, LyrSrch wants to know the **one** layer that contains walls.*

---

3 Pick the **LyrSrch** option twice (once to turn it off, the second time to go into the layer list.

4. Pick the layer called **Walls** from the list. You will be returned to the DoorSwng menu.

5. The hinge side will be located 4" off the inside corner of the wall, so you will want to reference this corner to measure from. Press the reference key **(~)**.

6. Object snap to the corner shown in Figure 3.4. Do you see the draw mark? Is it correctly in the corner? If not, press the (Esc) key and try again!

Use Quick Key!

~

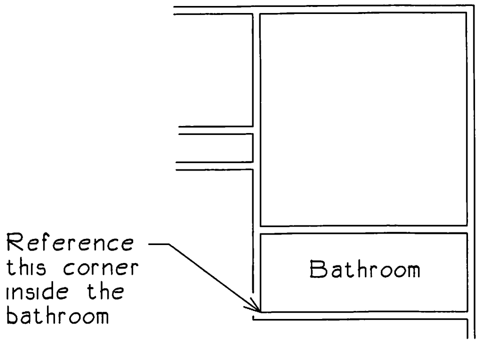


Figure 3.4: Object snap to the inside corner of the bathroom wall.

7. Press the **(Spacebar)**.
8. Press (Enter) to accept **0** in the X direction.
9. Type in **.4** and press (Enter) for the Y direction.
10. Move your cursor and you will notice that your line is connected to the wall. Is it in the correct spot for the hinge? If not, press mouse button 3 and start over.

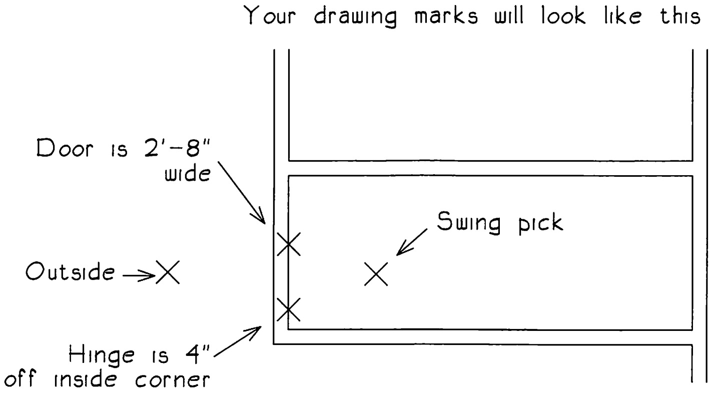

Your drawing marks will look like this
Door is 2'-8" wide
Swing pick
Outside
Hinge is 4" off inside corner

Figure 3.5: Showing the steps in building the bathroom door.

11. Now press the (Spacebar) again.
12. Press (Enter) to accept **0** in the X direction.
13. Type in **2.8** and press (Enter) for the Y direction. Look for your draw marks. Are they in the correct locations? If not, press mouse button 3 and start over.
14. Pick on the inside of the bathroom to indicate the swing direction, as shown in Figure 3.5.
15. Pick in the hall to indicate the outside of the room. The door will be created.
16. Press the **(Esc)** key to clear the draw marks.

Use Quick Key!

Esc

If you make a mistake...

See the section at the end of the chapter called "**Removing doors and windows**".

Making the door for bedroom 2

Use Quick Key!

~

1. The next door you will make is the door for "BEDROOM 2". Press the reference key **(~)**.
2. Object snap to the corner shown in Figure 3.6. Look for your draw mark. Is it in the exact corner?
3. Press the **(Spacebar)**.
4. Press (Enter) to accept **0** in the X direction.
5. Type in **.4** and press (Enter) for the Y direction.
6. Move your cursor and you will notice that your line is connected to the wall. Is it in the correct spot for the hinge? If not, press mouse button 3 and start over.
7. Now press the **(Spacebar)** again.

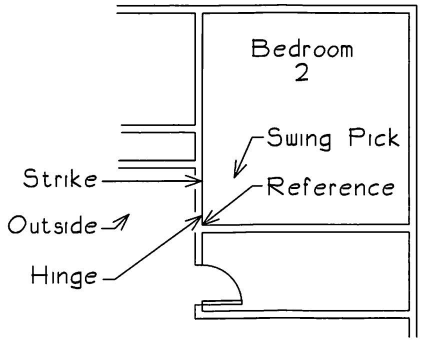


Figure 3.6: Steps for the bedroom door.

8. Press (Enter) to accept **0** in the X direction.
9. Type in **3** and press (Enter) for the Y direction. Look for your draw marks!
10. Pick on the inside of the bedroom to indicate the swing direction.
11. Pick in the hall to indicate the outside of the room. The door will be created.
12. Press **(Esc)** to clear the draw marks.

Use Quick Key!

Esc

Creating the double door for the entry

1. This is a double door, so pick the **Double** option, found in the DoorSwng menu, to make it active (green).
2. You will locate the door by the center of the door and one side, so make sure **Sides** is TURNED OFF (red). The message will read: *Doors defined by center and strike side.* This same message is displayed for both single and double doors. However, for a double door (sliding and bi-fold also), you will actually define the center and one of the "hinged" sides.
3. Object snap to the center, as shown in Figure 3.7.

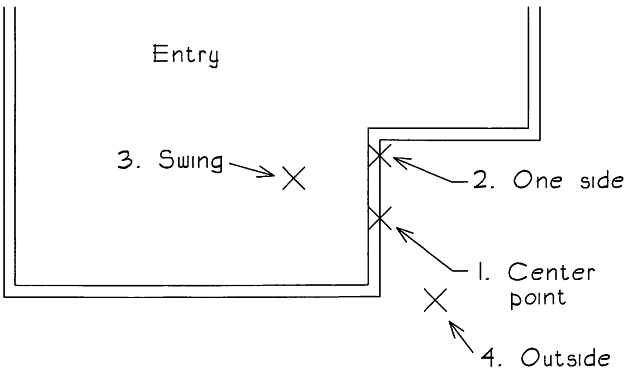


Figure 3.7: Showing the steps for the Entry door.

4. Press the **(Spacebar)**.
5. Press (Enter) to accept **0** in the X direction.
6. Type in **3** and press (Enter) for the Y direction.
7. Pick on the inside of the Entry to indicate the swing direction.
8. Pick to the outside. The door will be created.
9. Press **(Esc)** to clear your draw marks.

Use Quick Key!

Esc

Setting the Coordinate input mode

The next door you will make is the master bedroom door. Since this door will be located on an angle, you will want to type in the size of the door on the same angle to properly define it. To do so, you will use the input mode called *Relative Polar Coordinates*. This mode allows you to define the distance and the angle.

Use Quick Key!

Insert

1. Press the **(Insert)** key. Notice the message reads: "Current mode = absolute Cartesian".
2. Press the **(Insert)** key again. Now the message reads "Current mode = Relative Polar." This is the correct setting.

Note: *If you do not have an extended keyboard, the (Insert) key appears in the number pad as the* ***(Ins)*** *key (as it also does on extended keyboards as an alternate Insert key). To use this key, simply make sure the (Num Lock) is OFF.*

Making the Master bedroom door

1. The master bedroom door is a double door again. **Double** should still be active, and **Sides** should be OFF (red).
2. Object snap to the center of the wall, as shown in Figure 3.8.
3. Press the **(Spacebar)**.
4. Type in **3** and press (Enter) to define the distance for one side of the door.

5. Type in **45** and press (Enter) for the angle. Check your draw marks.
6. Pick on the inside of the bedroom to indicate the swing direction.
7. Pick in the hall to indicate the outside of the room. The door will be created.

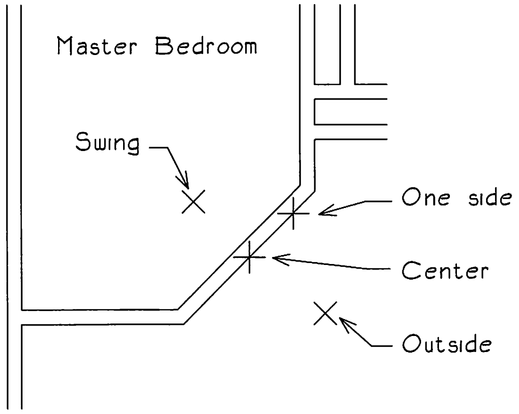


Figure 3.8: The steps for the Master bedroom door.

The linen closet door

To create the linen closet door in the hallway, you will want to first change the coordinates back to relative Cartesian.

Use Quick Key! **Insert**

1. Press the **(Insert)** key. Notice the message reads: "Current input mode = absolute polar".
2. Press the **(Insert)** key again. Now the message reads "Current input mode = Relative Cartesian." This is the setting you will be using next.
3. The linen closet is a bi-fold door, so pick **Bi-Fold** until it is active (green). **Sides** should still be OFF (red).
4. Object snap to the center, as shown in Figure 3.9.

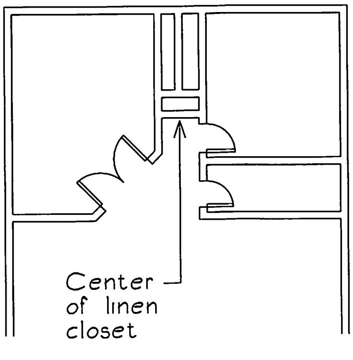


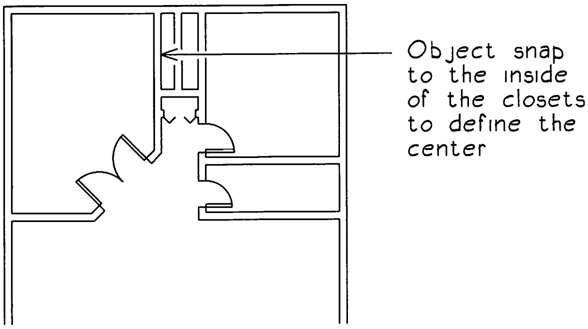
Figure 3.9: Drawing the linen closet.

5. Press the **(Spacebar)**.
6. Type in **1.6** and press (Enter) to define the X distance for one side of the door.

7. Press (Enter) to accept **0** in the Y distance. Check your draw marks.
8. Pick in the hall to indicate the swing direction.
9. Pick in the hall to indicate the outside of the closet. The door will be created.
10. Press the **(Esc)** key to clear the draw marks.

Bedroom closet doors

1. Make sure the **Sliding** option is active.
2. Object snap to the center of the first closet, picking inside the closet as shown in Figure 3.10.
3. Press the **(Spacebar)**.
4. Press (Enter) to accept **0** in the X distance.
5. Type in **3.6** and press (Enter) to define the Y distance for one side of the door. Check your draw marks.
6. Pick in the bedroom to indicate the outside of the door. The door will be created.



Object snap to the inside of the closets to define the center

Figure 3.10: The steps for the bedroom closet doors.

Use Quick Key!

Shift

F

7. Use the same directions to create the second closet door.
8. Press **(Esc)** to clear the draw marks.
9. Press **(Shift) F** to File your drawing.

Creating the front windows

Creating windows is just as easy, if not easier, than doors!

Use Quick Key!

A

1. Press the **(Tab)** key to go to the **Windows** layers. Notice that your cursor is now cyan.
2. Press **A** to go to the Architect menu.
3. Pick **Windows**.

Use Quick Key!

~

4. Notice that the **Sides** option is still OFF (red). This will allow you to create your windows by a center point.
5. Press the reference key **(~)** and object snap to the lower corner of the outside front wall, as shown in Figure 3.11.
6. Press the **(Spacebar)**.

7. Type in **-7.1** and press (Enter) to define the X distance for the center of the window.

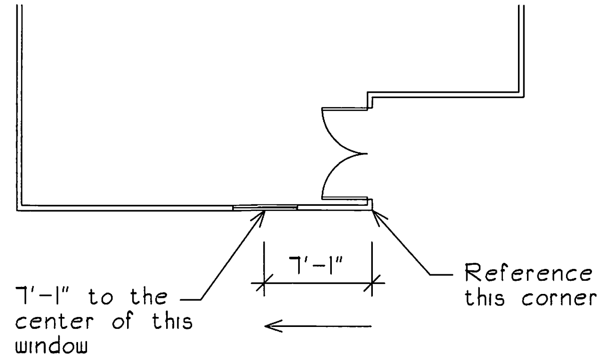


Figure 3.11: Steps to create the first window.

8. Press (Enter) to accept **0** in the Y distance. Move your cursor. Does it look like it is connected in the correct spot for the window center?
9. Press the **(Spacebar)** again.
10. Type in **2** and press (Enter) for the X distance.
11. Press (Enter) to accept **0** in the Y distance.
12. Pick below the front wall to indicate the outside. The window will be created.
13. Press the reference key **(~)** and object snap to the center of the window you just made, as shown in Figure 3.12. You will use this point to measure from.

Use Quick Key!

~

14. Press the **(Spacebar)**.
15. Type in **-7.11** and press (Enter) to define the X distance for the center of the window.
16. Press (Enter) to accept **0** in the Y distance. Move your cursor. Does it look like it is connected in the correct spot for the window center?

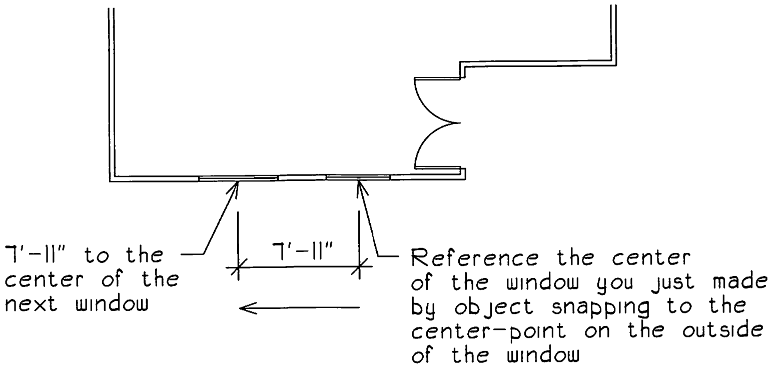

7'-11" to the center of the next window
7'-11"
Reference the center of the window you just made by object snapping to the center-point on the outside of the window

Figure 3.12: The second window.

17. Press the **(Spacebar)** again.
18. Type in **2.6** and press (Enter) for the X distance.
19. Press (Enter) to accept **0** in the Y distance.

20. Pick below the front wall to indicate the outside. The second window will be created.

Creating the side windows

Use Quick Key!

~

1. Press the reference key **(~)** and object snap to the lower left corner of your building, shown in Figure 3.13. You will use this point to measure from.
2. Press the **(Spacebar)**.
3. Press (Enter) to accept **0** in the X distance.
4. Type in **10.0** and press (Enter) for the Y distance to define the center location of the window. Move your cursor. Does it look like it is connected in the correct spot for the window center?

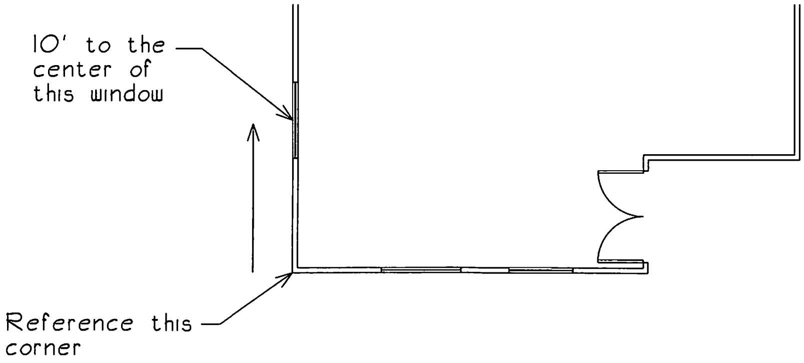


Figure 3.13: Drawing the first side window.

5. Press the **(Spacebar)** again.
6. Press (Enter) to accept **0** in the X distance.
7. Type in **2.6** and press (Enter) for the Y distance. Check your draw marks.
8. Pick to the left side of the wall to indicate the outside. The window will be created.
9. Press the reference key **(~)** and object snap to the upper left corner of your building, as shown in Figure 3.14. You will use this point to measure from for the next window.

Use Quick Key!

~

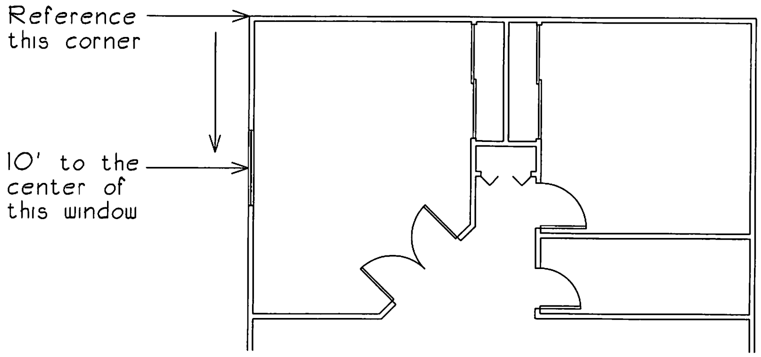


Figure 3.14: The second side window.

10. Press the **(Spacebar)**.

11. Press (Enter) to accept **0** in the X distance.
12. Type in **-10.0** and press (Enter) for the Y distance to define the center location of the window. Move your cursor. Does it look like it is connected in the correct spot for the window center?
13. Press the **(Spacebar)** again.
14. Press (Enter) to accept **0** in the X distance.
15. Type in **2.6** and press (Enter) for the Y distance. Check your draw marks.
16. Pick to the left side of the wall to indicate the outside. The window will be created.
17. Press **(Esc)** to clear the draw marks.

The Kitchen window

At this point you really haven't worried too much about how your drawing looks in 3D. Even though you are not using the modeling part of DataCAD, you are still drawing a simplified 3D drawing. Later, you will even view it and shade it in 3D. In order to correctly create a kitchen window that will clear the 3'-0" counter that you will put in, you will adjust the sill height before you draw it.

Use Quick Key!

~

1. Pick the **Sill Hgt** option.
2. Type in **3.4** for the bottom of your window. Press (Enter).
3. Press the reference key **(~)** and object snap to the outside right corner of the kitchen area, as shown in Figure 3.15. You will use this point to measure from.

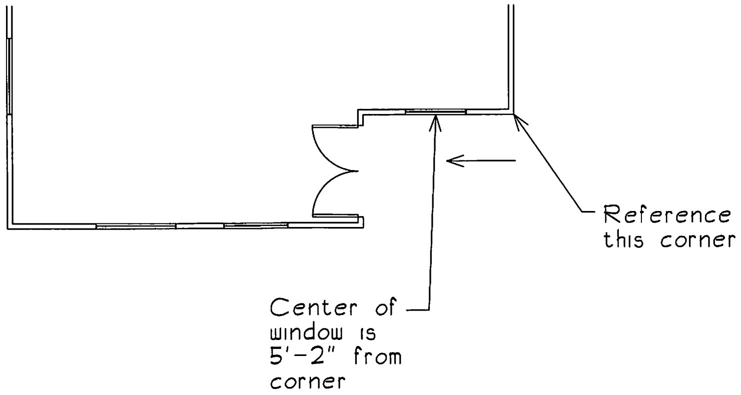


Figure 3.15: Drawing the kitchen window.

4. Press the **(Spacebar)**.
5. Type in **-5.2** and press (Enter) to define the X distance for the center of the window.
6. Press (Enter) to accept **0** in the Y distance. Move your cursor. Does it look like it is connected in the correct spot for the window center?
7. Press the **(Spacebar)** again.
8. Type in **2** and press (Enter) for the X distance.

Use Quick Key!

Shift

F

9. Press (Enter) to accept **0** in the Y distance. Look at your draw marks.
10. Pick below the front wall to indicate the outside. The second window will be created.
11. Press (Shift) **F** to File your drawing.

Removing doors and windows

If you make a mistake during the insertion of a door or window, you can easily fix it! The Architect menu contains a Remove option in DoorSwng, Windows and Cut Wall. Any one of these three options can be used interchangeably.

Use Quick Key!

A

1. Press **A** to go to the Architct menu.
2. Pick **DoorSwng**.
3. Pick the **Remove** option.
4. Pick two points to indicate a remove-box around the door, window or wall opening you wish to remove.

   There *must* be a small piece of wall left on either side of the remove-box to work. (It will "weld" the wall back together.) Also, the box must surround the entire door or window to work. See Figure 3.16 for the proper remove-box location.

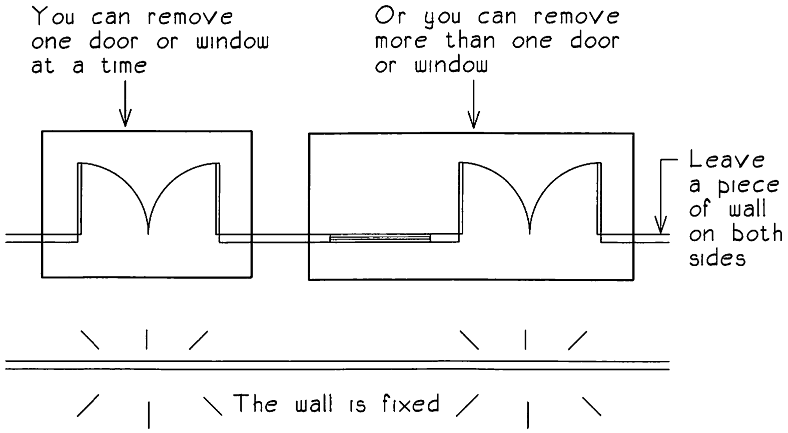

You can remove one door or window at a time
Or you can remove more than one door or window
Leave a piece of wall on both sides
The wall is fixed

Figure 3.16: Showing the correct way to remove a door or window.

Note: *You can remove several doors, windows, and wall openings at one time if they are placed in the same wall. Draw the remove-box around all of the items, making sure to leave parts of the walls on either side. This technique will not work if there is a wall intersection included in the remove box.*

Chapter Summary

You may want to continue to the next chapter if you feel comfortable with the insertion of doors and windows. If you started another project during the last chapter, and have already laid out the walls, now would be a good time to reinforce your new skills by putting the doors and windows in!

During this chapter, you learned:

To turn on the draw marks to aid you in defining the placement of doors and windows.

How to define doors, using single, double, folding, and sliding.

The techniques for defining doors by sides and centers.

How to put in various size windows.

To change the sill height of a window for viewing later in 3D.

The (Insert) key is used to define the type of coordinate input you want to use.

Polar input is very useful to define an exact distance along an angle.

You can remove a door, window, or opening easily using the Remove option found in the Architect sub-menus.

CHAPTER 4

Adding Symbols to Your Drawing

Adding symbols is very straightforward in DataCAD. The first area you will add symbols to is the kitchen. First, you will add a counter (which is not a symbol), then, you will add the necessary symbols to complete the kitchen plan. You will continue by adding the bathroom symbols. Finally, you'll create an electrical layout.

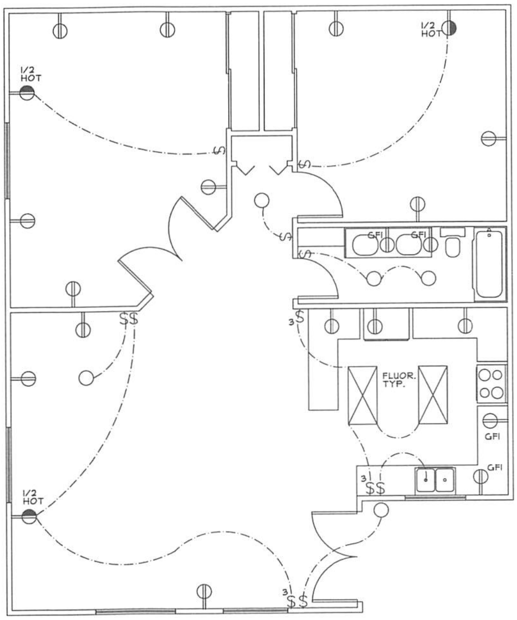


Figure 4.1: Symbols and electrical plan added.

Changing the Z height

The counter will be created with the proper 3D information to define the height. This is referred to as Z height. Normally, you would not have to worry about the Z height in production layout drawings. However, you will be viewing your house in a perspective later and shading it in 3D.

Use Quick Key!

Z

1. Press the **Z** key.
2. Press (Enter) to accept the Z base (floor) of **0**.
3. Type in **3** and press (Enter) to change the Z height to a 3'-0" counter level.

Using Walls for your counter

It sounds funny, but you can use the Walls feature to create your counters quickly and easily. You just adjust the wall width to two feet!

Use Quick Key!

A

1. Press **(Tab)** to go to the Cabinet layer.
2. Press **A** to go to the Architect menu.
3. Make sure **Walls** and **Sides** are green.
4. Pick the **Width** option and type in **2**, then press (Enter).
5. Pick **Cap** to make this option green. Now the ends of your walls will be "capped" off.
6. Object Snap to the first point of the counter, shown in Figure 4.2.
7. Object Snap to the second point.
8. Pick out in the kitchen area to create the inside part of the counter.

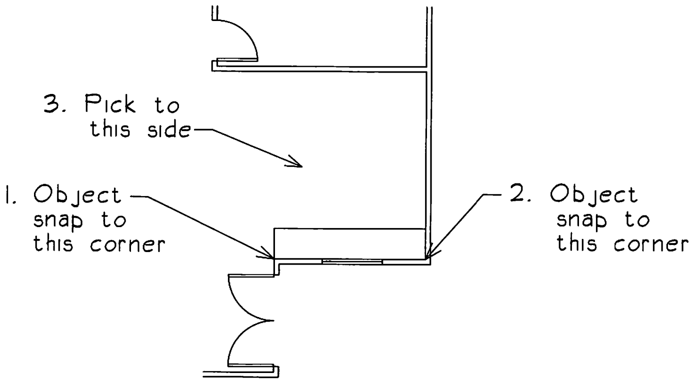


Figure 4.2: Object snap for the first edge of the counter.

9. Object Snap to the third point of the counter, shown in Figure 4.3.
10. Pick out in the kitchen area to create the inside part of the counter.

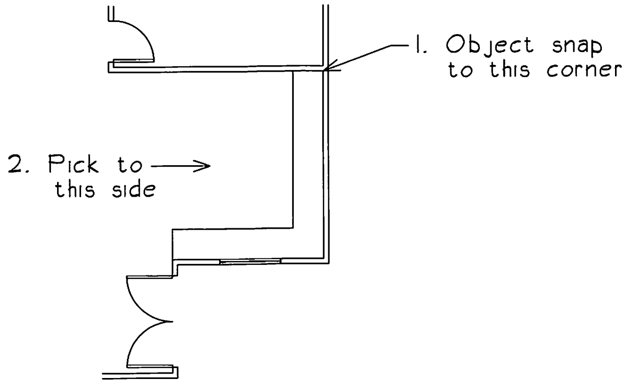


Figure 4.3: Object snap to the next corner.

11. Since the next point is measured off of the hallway wall, press the reference key **(~)**.

Use Quick Key!

~

12. Object snap to the hallway corner, shown in Figure 4.4.
13. Press the **(Spacebar)**.
14. Type in **1.4** for the X distance. Press (Enter).
15. Press (Enter) to accept **0** in the Y.
16. Pick out in the kitchen area to create the inside part of the counter.

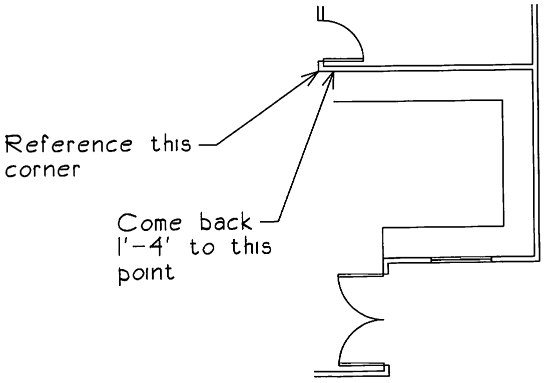


Figure 4.4: Referencing the hall corner.

17. To define the eating counter, press the **(Spacebar)**.
18. Press (Enter) to accept **0** in the X.
19. Type in **-6** for the Y distance. Press (Enter).
20. Pick out in the kitchen area to create the inside part of the counter, as in Figure 4.5.
21. Press mouse button 3 to quit. The end of the counter is capped automatically.

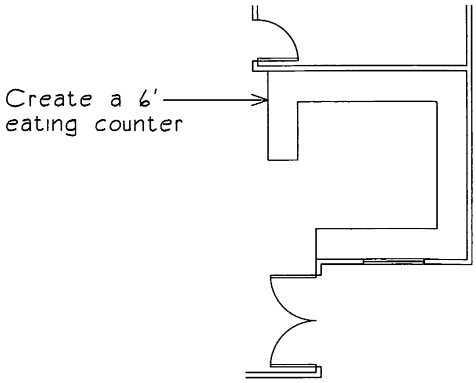


Figure 4.5: Creating the eating counter.

Calling up DataCAD Symbols

Now your kitchen is ready for the appliances. Several symbols come with DataCAD that you can use. You may also want to create your own later.

1. Press **(Tab)** to go to the **Plumbing** layer.
2. Press **T** to go to the Template menu. The list of currently available template will be displayed.
3. Pick the **New Path** option. The current path will be displayed. You will type in the path so that it matches exactly what DataCAD wants in order to display the PLUMBING templates.
4. Type in: **tpl\plumb** and press (Enter).

Use Quick Key!

T

Note: *Make sure you use the "\ " backslash, and* not *the "/" forward slash. Do not add spaces, either. You should get the plumbing templates displayed, and not "This directory does not exist"! If you get this message, pick NO and try again, starting at step 2 above.*

---

5. Pick the template called **RESIDENC**. It will be displayed on the screen.

Placing Symbols

1. Move your cursor over to the template boxes. Notice that when you have the cursor in a box, its name appears in the message area of your screen.

   Can you find the symbols called **Sink**? You will use the double sink.
2. Notice this sink is facing south. You want it to face north. (You can tell if you look close - the double line on the bottom is actually the door fronts.) Even though this is a free standing sink, you can use it for this exercise and create your own later.
3. Pick the **DynmRot** option until it is active (green). DynmRot allows you to rotate the symbol as you place it. First you pick

the insertion point, which places the symbol. This point then becomes the pivot or stationary point for the symbol. Now you can rotate it, about that point, to the correct angle with your cursor, as shown in Figure 4.6.

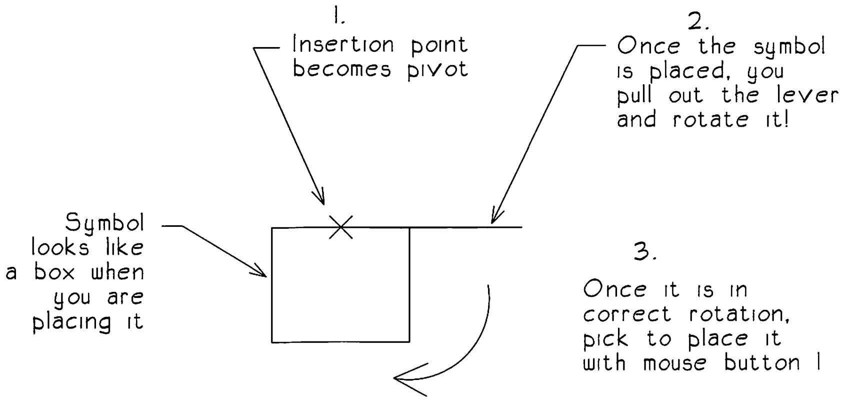

1.
Insertion point becomes pivot
2.
Once the symbol is placed, you pull out the lever and rotate it!
Symbol looks like a box when you are placing it
3.
Once it is in correct rotation, pick to place it with mouse button 1

Figure: 4.6: Steps for placing and rotating a symbol.

4. Pick the symbol that looks like a double sink (use mouse button 1).
5. Move your cursor onto the drawing area. Notice a box is attached to your cursor. This box indicates the maximum size of your symbol. (See Fig. 4.6.)
6. Object snap to the kitchen window to center your sink symbol, as shown in Figure 4.7.

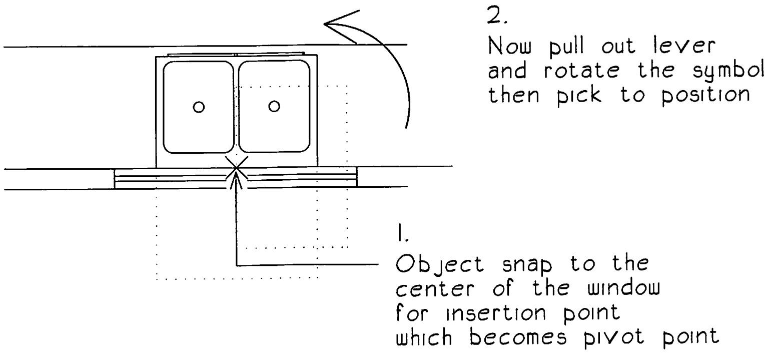

2.
Now pull out lever and rotate the symbol then pick to position
1.
Object snap to the center of the window for insertion point which becomes pivot point

Figure 4.7: Place and rotate the sink symbol.

7. Move the cursor to the right. Notice a handle lever is displayed. This is your lever to rotate the symbol. When the lever is to the right, your symbol is in its original position.
8. Move your cursor over to the left of the symbol box, pulling it far enough that you can see the lever. Now your symbol is rotated over.
9. Pick to position your symbol. It will appear. You may notice a small "x" displayed at the origin point of your symbol. This "x" means that the sink is a symbol, and is a visual aid to help you identify symbols on your drawing. It will not plot.
10. Does your symbol look correct? If not, press the quick erase key **(<)** and try again!
11. Press mouse button 3 to let go of the sink symbol. Now you can select the next symbol.

12. Pick the Stove symbol. To place this in the middle of the cabinets, object snap to the mid-point of the wall, as shown in Figure 4.8.

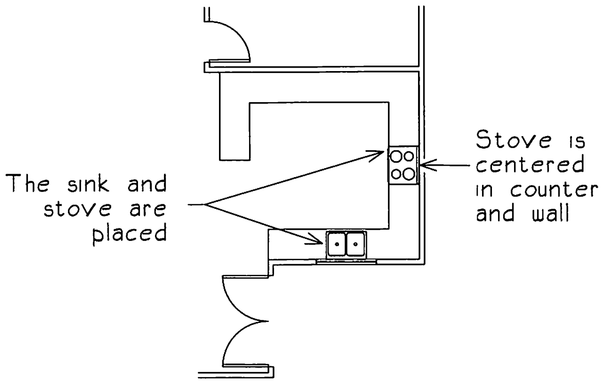

The sink and stove are placed
Stove is centered in counter and wall

Figure 4.8: Placing the sink and the stove.

13. Press mouse button 3 to let go of the stove symbol.
14. Pick one of the symbols called "Wardrobe" These symbols work well as refrigerators!
15. Place and rotate your "refrigerator" 2'-0" from the edge of the eating counter, as in Figure 4.9. To do this:

Use Quick Key!

~

Press the **(~)** reference key.
Object snap to the inside edge of the counter to reference.
Press the **(Spacebar)**.
Type in **2** for the X, Enter.
Type in **0** for the Y, Enter.
Rotate into position.

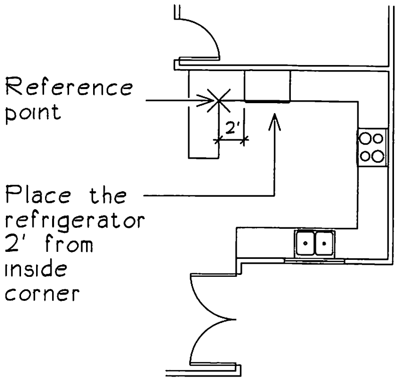


Figure 4.9: Add the refrigerator.

Cutting the counter

Use Quick Key!

Tab

Once you've placed your symbols, you will want to cut the counter around them.

Use Quick Key!

A

1. Press **(Tab)** to go to the **Cabinet** layer. (Did you know that holding down the **(Shift)** key and pressing **(Tab)** moves you *backwards* through the layers list?)
2. Press **A** to go to the Architect menu. (Notice that your symbol is let go once you've used a quick key.)

3. Pick **Cut Wall**.
4. Pick **LyrSrch** to turn it OFF (red). This way, your real walls won't be cut. Only the active layer, the "cabinet" layer, will be searched to cut.
5. Pick 2 points, 1 on each side of the refrigerator, as in Figure 4.10.

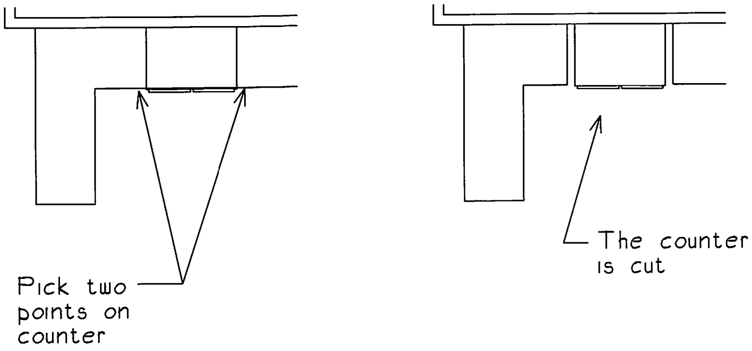


Figure 4.10: Cutting the counter around the refrigerator.

6. Pick two points to cut around the stove also, as shown in Figure 4.11.

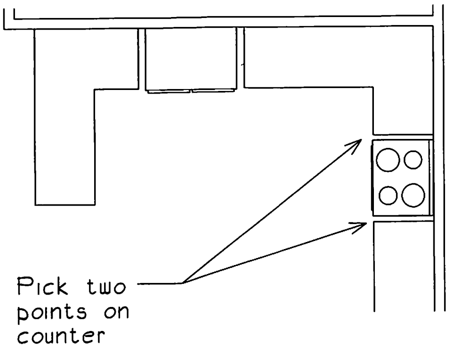


Figure 4.11: Cutting the counter around the stove.

The bathroom symbols

The bathroom requires a look that is a little different than the current symbols offered in this template. When you add a symbol, the symbol looks at it as one item. To modify the symbol, then, it must be "exploded". Using this option in the Template menu, a symbol then becomes simple lines, arcs, etc., and can be modified.

Use Quick Key!

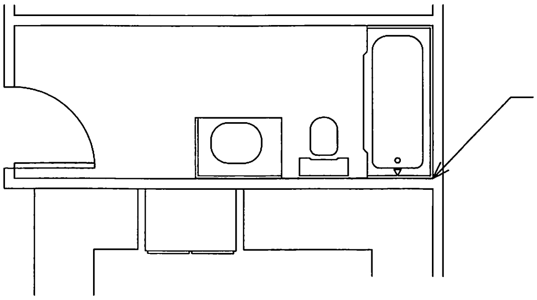
Tab

1. Press **(Tab)** to go to the **Plumb** layer.
2. Press **T** to go to the Template menu.
3. In the Template menu, pick **Explode** to make it active (green).
4. Pick the symbol called **BathGrup**.
5. Drag the symbol out into the bathroom. Object snap to the corner indicated in Figure 4.12.

Use Quick Key!

T

6. Rotate the symbol into place. Pick to place it. Your bathroom should look like Figure 4.12.



With Explode on, object snap to this corner for the pivot point

Figure 4.12: Place and rotate the BathGrup.

Mirroring items

Use Quick Key!

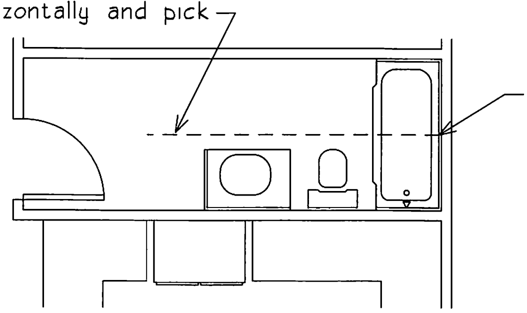
Alt

M

Now you can mirror the group into the correct orientation.

1. Press **(Alt) M** to go to the Mirror menu, by holding down the (Alt) key and pressing M. (Notice how you didn't have to press mouse button 3 to release the symbol before you used a quick key.)
2. Object snap to the midpoint of the wall, as shown in Figure 4.13.
3. Drag a horizontal line out and pick. This will be your mirroring line.

2. Drag line out horizontally and pick



1. Object snap to midpoint of wall for mirror line

Figure 4.13: Defining a mirror line.

4. Pick **Group** to make it active.
5. Make sure **AndCopy** is OFF (red).
6. Pick a line of your BathGrup. The group will be flipped over. Check the results. If the BathGrup no longer lines up with your wall, you may have not gotten the correct midpoint for the mirror line. Pick Undo and start over.

Stretching

Now you are going to "stretch" the counter in your bathroom so that you can add another sink.

1. Press **(Alt) S** to go to the Stretch menu, by holding down the (Alt) key and pressing S.
2. Pick anywhere in the drawing area to start a distance measurement, as shown by step 1 in Figure 4.14.
3. Press the **(Spacebar)** to type in the distance.
4. Type in **-3** and press (Enter) for the X direction.
5. Press (Enter) to accept **0** for the Y. The message should read: Distance to stretch: 3'-0" Angle: 180-0.
6. Pick two points to define a box around the vanity counter end, as shown in Figure 4.14.

Use Quick Key!

Alt

S

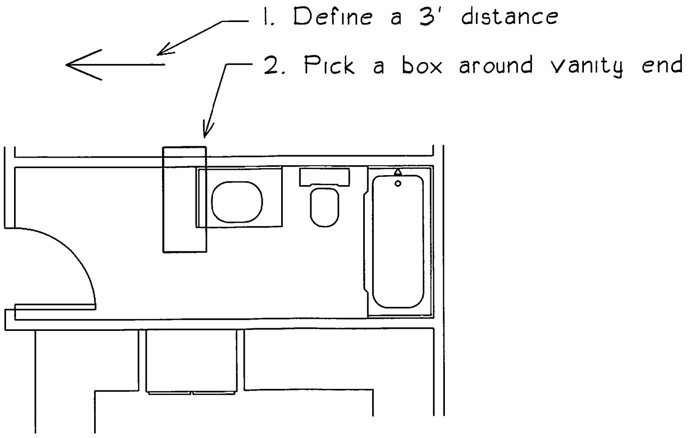


Figure 4.14: Stretching the bathroom counter.

7. Your counter will stretch. Press mouse button 3 to Exit.

Copying

Now you will want to copy the washbowl.

Use Quick Key!

C

1. Press **C** to go to the Copy menu.
2. Pick a "from" point, as shown in step 1, Figure 4.15. This should be the left edge of your sink.
3. Pick a "to" point, as shown by step 2 in Figure 4.15. Your "to" pick should be indicating where the left edge of the new sink will be.

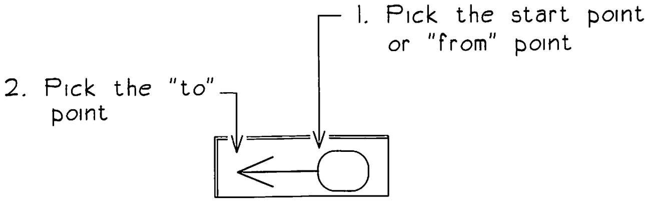


Figure 4.15: Pick two points for copying.

4. Pick **Area** until it is active.
5. Pick two diagonal points to indicate an area, enclosing the washbowl as shown in Figure 4.16.

6. The copy is made. Notice that it may not be positioned correctly. Pick **Undo** to try another technique.

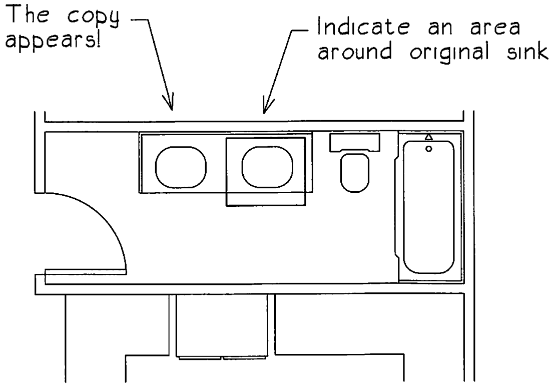


Figure 4.16: Copying the washbowl.

Use Quick Key!

Alt

M

7. Press **(Alt) M** to go to the Mirror menu.
8. Object snap to the mid-point of the sink counter, as shown in Fig 4-17.
9. With Orthomode ON (SwOTHLUD), pick a straight vertical line indicating a reflection line.
10. **Area** should still be active.
11. Pick **AndCopy** to make it active. This option will make a copy of the original sink.
12. Pick two diagonal points to indicate an area, enclosing the washbowl as shown in Figure 4.17.
13. The copy is made. Notice that this time it is exactly positioned symmetrical to the first sink.

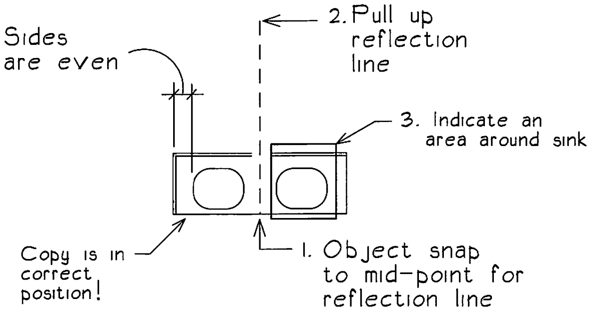

Sides are even
2. Pull up reflection line
3. Indicate an area around sink
Copy is in correct position!
1. Object snap to mid-point for reflection line

Figure 4.17: Mirroring and copying the washbowl.

Drawing the Electrical sheet

Creating the electrical layout for the kitchen area requires a little more effort, but is still a breeze in DataCAD. And, since there isn't an Electrcl layer, you will want to create one.

Use Quick Key!

L

Creating a layer

1. Press **L** to go to the Layers menu.

2. Pick the **NewLayer** option.
3. Press (Enter) to accept **1**. This will create one new layer.
4. Pick **Name**.
5. Pick the last layer that appears on your layer list. That name, as an example Layer10, will appear at the text line in the message area.
6. Type in **Electrcl** and Press (Enter). A layer name is limited to 8 characters.

Note: *ALWAYS adhere to DOS naming conventions for layer names. This means no spaces and no special characters! (Such as a star *, &, #, or @.) You will want to be extra careful if you are "talking" to other softwares using DXF transfers. Special characters will cause errors during the importing of DXF files into some softwares.*

Use Quick Key!

Tab

7. Press mouse button 3 to quit from the layer naming menu.
8. Press **(Tab)** until the **Electrcl** layer is active.
9. Press the **K** key to change the active layer color to **Red**.

Use Quick Key!

K

Changing Templates

Use Quick Key!

T

1. Press **T** to go back to the Template menu.
2. Pick **New File** from the menu.
3. Since you will be using the Electrcl template, you will want to change to the proper path. Pick **NewPath**.
4. Notice the current path: **tpl\plumb\**.
5. Press the function key number F2 to select the **..** option that appears in the F2 position in the menu. This option will take you *up* one directory at a time.
6. Now the path says: **tpl** and there are options appearing that correspond to pathnames.
7. Pick **Elec**. The path now reads **tpl\elec\**. Press (Enter) to accept the pathname.
8. The electrical template list will be displayed. Pick the template called **RCPTCL**. The receptacle symbols will appear in boxes on your screen.

Figure 4.18 shows the electrical layout for the kitchen. Notice what symbols you will use. The wiring layout will be drawn using an arc option.

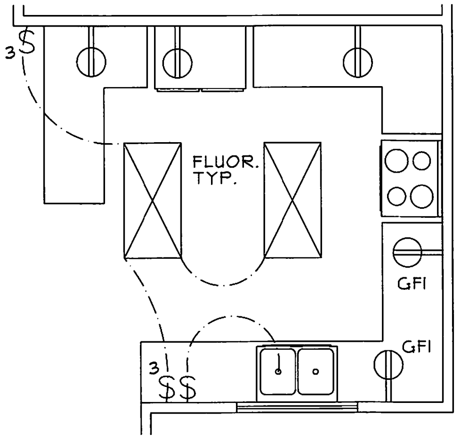


Figure 4.18: The electrical layout.

1. Window into the Kitchen area of your drawing, by picking the **W** button in the control panel, which goes to the WindowIn menu.

Use Quick Key! X

2. Pick two diagonal points to indicate the area you want to work in. This will be the kitchen area. It will be enlarged.
3. Press mouse button 3 to exit from the WindowIn menu.

Use Quick Key! S

4. Before placing symbols, check that your grid Snap is ON (S is big in SWOTHLUD). If it isn't, press the **X** until the message says: Snap is on.
5. You will want your snap set to 1". If it isn't, press the **S**. You will be prompted to set the X grid snap. Type in **.1** or pick **1"**. Press (Enter). Press (Enter) again to accept **.1** in the Y direction also.

Use Quick Key! T

6. Press **T** to go back to the Template menu.
7. Pick **Explode** to turn it OFF (red).
8. Pick the **Duplex Recept Outlet** symbol and place it as shown. Make sure the handle touches the wall as you pick the origin point to place it.
9. Add all of the outlets to the kitchen, as shown in Figure 4.19.

Note - If you are creating another scale drawing, such as 1/8" = 1'-0", you would change the scale of the electric symbols to match your drawing. For a 1/8" drawing, you would double the size of these symbols by using the Enlarge, Set All options (found in the Template menu). You then would set the scale to 2.

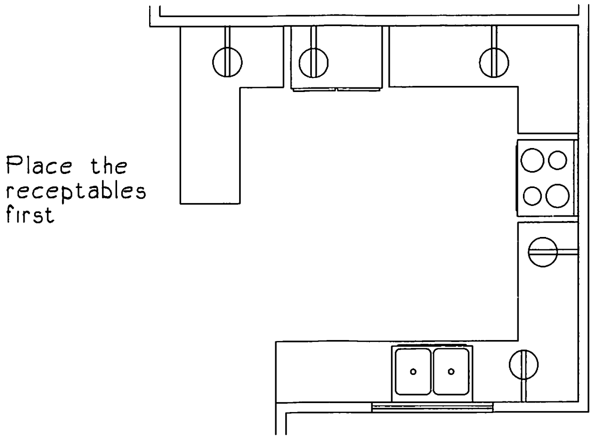


Figure 4.19: Add all of the outlets in the kitchen.

1. Once the outlets are added, pick **New File** from the Template menu.
2. Pick the template called **Switch**. It will be displayed on your screen.
3. Pick the **Single Pole Switch** from the template.
4. Place all of the switches as shown in Figure 4.20.

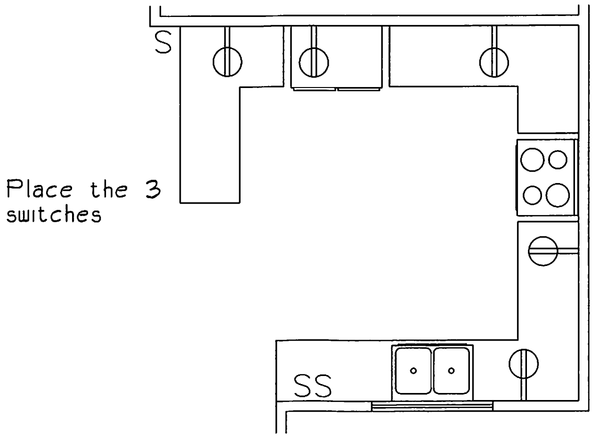
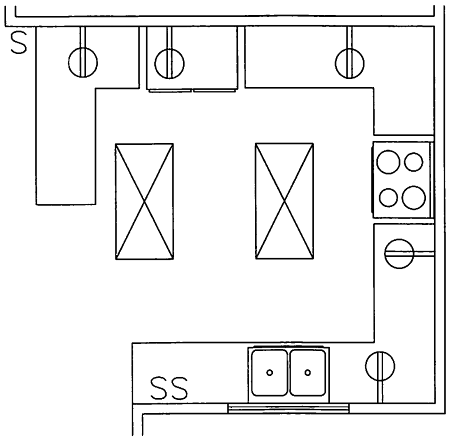


Figure 4.20: Place the switches for the kitchen area.

1. Once the switches are added, pick **New File** from the Template menu.
2. Pick the template called **FL_LIGHT**. It will be displayed on your screen.
3. Pick the **2x4 Fluorescent** from the template.
4. Place two fluorescent lighting symbols in your drawing, as in Figure 4.21.



Place the fluorescent lighting

Figure 4.21: Add the fluorescent lighting.

Wiring

Use Quick Key! **Alt** **L**

As explained earlier, the wiring is put in using simple arcs. You will also want a dot-dash line type.

1. Press **(Alt) L** to go to the Linetype menu.
2. Pick the linetype choice: **Dot-Dash**. Notice the current linetype name is changed to Dot-Dash in the status area of your screen, displayed over SwOTHLUD.
3. Pick **Spacing** to adjust the size of the line pattern.
4. Type in **1** and press (Enter). The pattern will be displayed in 1'-0" intervals.
5. Press mouse button 3 to Exit.
6. Check SwOTHLUD. If the **W** is capital, then your Walls option is on. To turn it off, press the **(=)** key (looks like a little wall). This is the quick key to turn walls on and off.
7. Press **(Alt) A** to go to the Curves menu.
8. Pick **3 pt Arc**.
9. Object snap to the switch, as in Figure 4.22.
10. Object snap to the fixture, as in Figure 4.22.
11. And then, pick to shape your arc, You may want to turn OFF orthomode to pick your arc, by pressing **O**.

Use Quick Key! **=**

Use Quick Key! **Alt** **A**

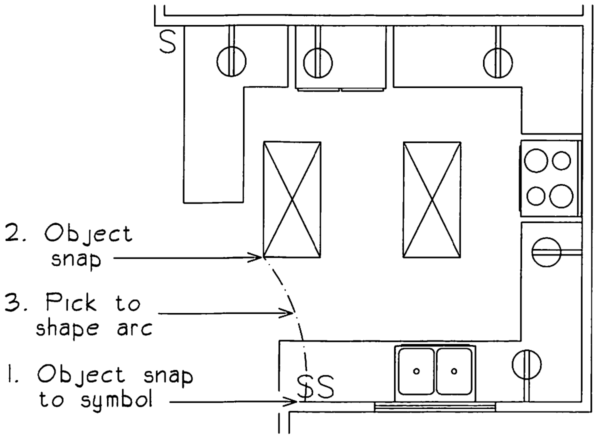


Figure 4.22: Creating the first arc for wiring.

12. Create the rest of the arcs for your kitchen electrical layout, as shown in Fig. 4.23. Remember to object snap to the symbols and pick only to shape the arc.

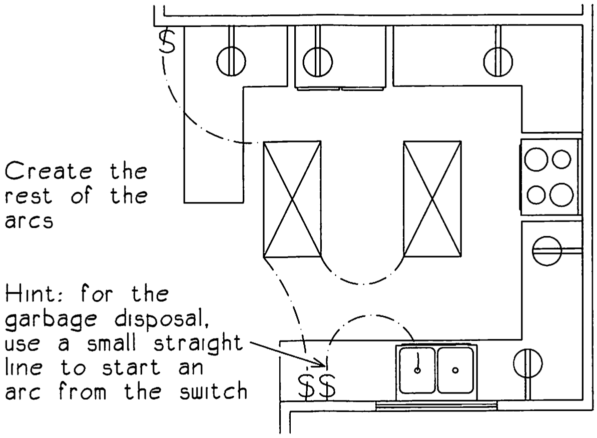

$
Create the rest of the arcs
Hint: for the garbage disposal, use a small straight line to start an arc from the switch
$$

Figure 4.23: Add the wiring arcs.

Creating notes

Symbol notes, room labels, and other layout notation are all added by using the Text option.

Use Quick Key!

Alt

T

1. Check that the Electrcl layer is still active. The first notes you add will be electrical notes.
2. Press **(Alt) T** to go to the Text menu.
3. Pick the **Size** option. The electrical symbol notes will be slightly smaller than 1/8". (1/8" = 6" when plotted at a 1/4" scale.) You will use 5".
4. Type in **.5** and press Enter.
5. Press **(Caps Lock)** to type in capital letters.
6. The first note you will add is the FLUOR. TYP. Pick between the two fixtures to start your note, as indicated in Figure 4.24.

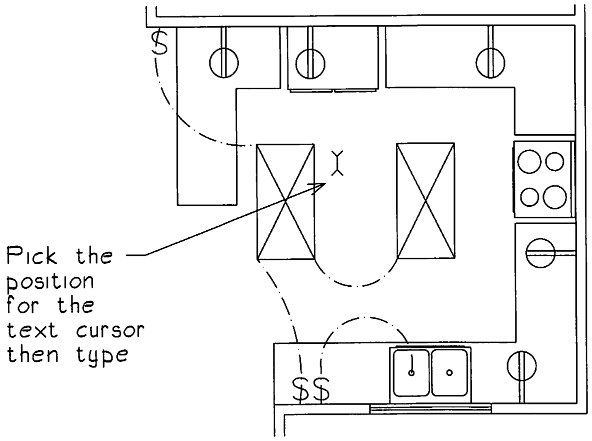


Figure 4.24: Starting a text line.

7. Type in **FLUOR.** and press (Enter).
8. Notice the text cursor jumped to the next line. This is because you can type in a whole paragraph if you wanted to. Type in **TYP.** and press (Enter) again.
9. Since you are done with this note, press mouse button 3 to quit the paragraph.
10. Pick by the sink outlet to type in your GFI note, as shown in Figure 4.25.
11. Type in **GFI** and press (Enter).
12. Press mouse button 3 to quit the paragraph.
13. Continue adding your notes, as indicated in Figure 4.24, following the previous directions.

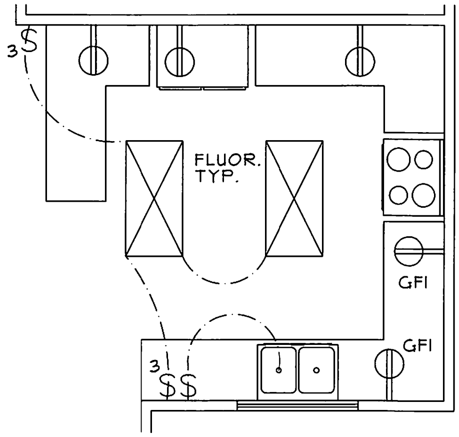


Figure 4.25: Adding notes to the kitchen electrical plan.

Finishing the Electrical layout

1. Following the steps in this chapter, continue to add all of the electrical symbols, arcs and notes to the rest of the layout, as shown in Figure 4.26. You will find the bathroom and dining lights in the **IN_LIGHT** template, using the **1'-0" Dia. Ceiling Light** symbol. You can use this same symbol to represent the porch light also.

2. When you are finished with typing in notes, press the **(Caps lock)** to turn it OFF.

Note: Many quick keys work differently if the (Caps lock) is left on, so leave it off when you are not typing in notes. Later, when you become accustomed to using DataCAD, these differences may not bother you. And, you can customize these keys so that it doesn't make a difference if (Caps Lock) is on or not.

Use Quick Key!

Shift

F

3. Press **(Shift) F** to File your drawing.
4. You may want to create a **Pictogram** of your drawing, for later previewing when you are in the drawing list. Remember, this option is found in the **Utility**, **File I/O**, **PixelOut** menus.

Use Quick Key!

Alt

N

5. If you wish to leave this drawing, press **(Alt) N** to go to File I/O, **New Dwg**. Pick **Yes** to exit and save your drawing. You may want to check your pictogram at this time.

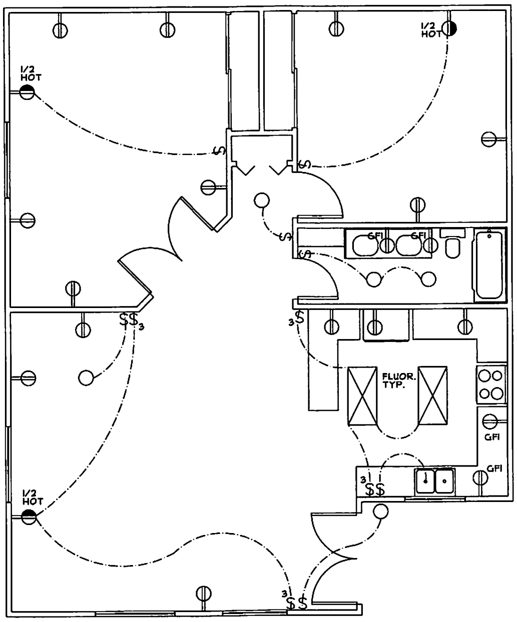


Figure 4.26: Complete your electrical plan.

Chapter Summary

During this chapter you learned the following:

How to adjust the Z height of the items you draw.

That you can use the "Walls" option for more than just drawing walls. You used it to draw counters!

How to add symbols to your drawing.

Rotating symbols as you add them.

Switching directory paths to access additional symbol templates.

You can use Cut Wall to cut openings in walls, or in this case, your counter.

Exploding symbols allows you to edit the items individually. (But they are, at this point, not a "symbol" once they have been exploded.)

Mirroring is easy to do. You can flip over the original items or make a copy.

You can stretch items to make them longer.

Copying items is a good way to make an exact duplicate, and worked well when creating the second washbowl.

You can easily create a new layer, name it and assign it a color.

Linetypes are useful and easy to define.

Notes are created using the Text option. You can type in a paragraph, or a single line.

CHAPTER 5

Adding Dimensions and Hatching

During this chapter you will be adding dimensions to your drawing. You will also add "hatching", a term used to describe adding a pattern texture, such as floor tiling and concrete texture.

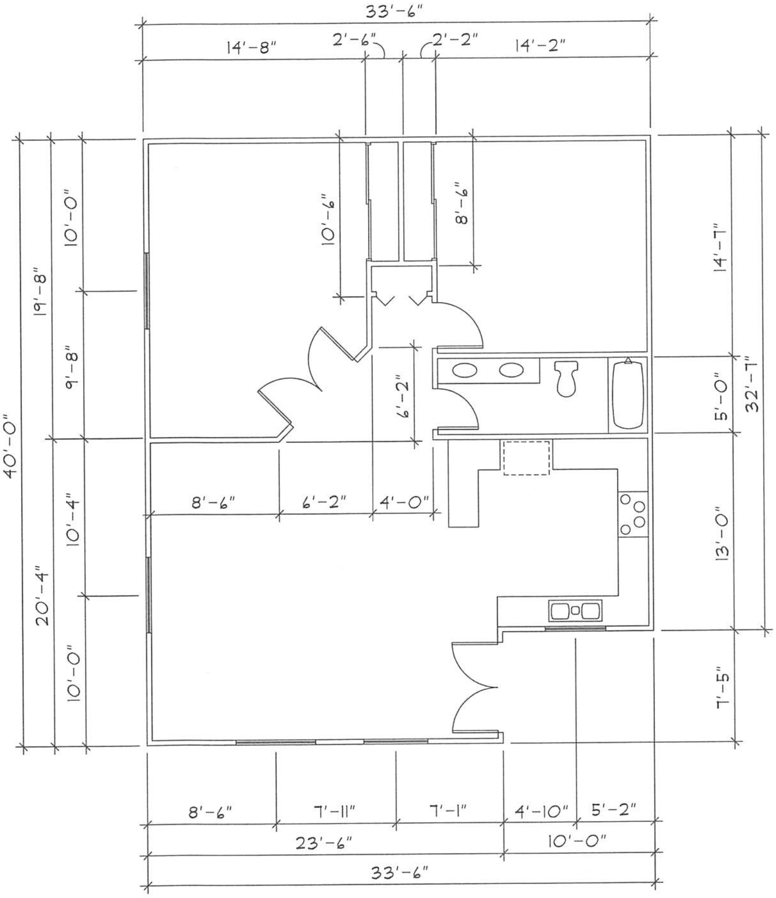


Figure 5.1: Your drawing with dimensions added.

Turning off layers

Before you add your dimensions, you will want to turn off the electrical layer.

Use Quick Key! L

1. Press **L** to go to the Layers menu.
2. Pick the **On/Off** option.
3. Pick the **Electrc** layer. The Function key number will turn red and the electrical symbols will be turned off and disappear from your drawing. But don't worry, they are still there and can be turned on again using this option.
4. Press mouse button 3 to exit the On/Off menu.

Checking your linetype setting

Use Quick Key! Shift Q

Look at the linetype setting that appears in the status area of your screen. Remember, it is displayed above SWOTHLUD. If you just finished the previous chapter, your linetype will be set to Dot-dash. Is it? If so, you can use the quick key to do a "Quick linetype change - Q. The Q key will take you through the 24 linetypes, while the **[Shift] Q** keys will take you backwards through the list.

1. You will want to press **(Shift) Q** three times, until the message reads: Current linetype is Solid.

Dimension Types

There are 4 types of dimensions in DataCAD, as shown in Figure 5.2. The most frequently used is **linear**.

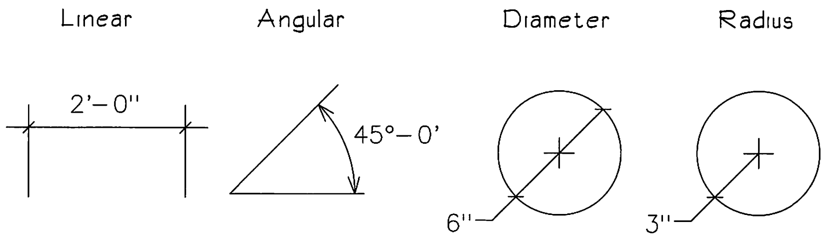


Figure 5.2: The 4 dimension types.

Dimension Variables

Dimensions are made up of many different parts that can be adjusted. Figure 5.3 shows what these parts are. All of the adjustments have been set in your default sheet to make your dimensions look good. You can, of course, change these to meet your own requirements.

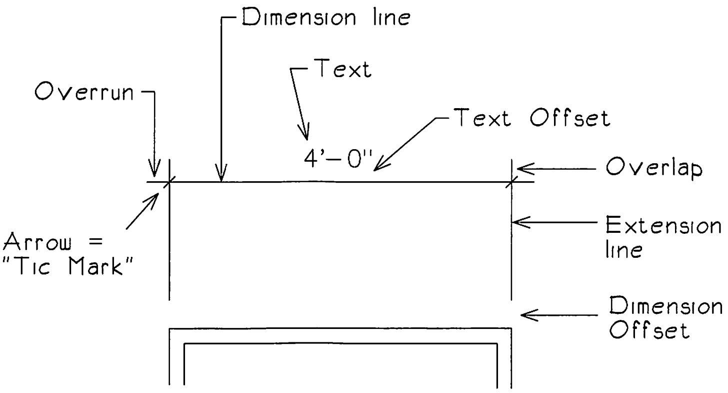


Figure 5.3: The breakdown of a dimension.

You will want to go into the Dimension menu to see what it looks like.

1. Press **(Tab)** to go to the **Dims** layer.
2. Press **D** to go to Dimension menu. You have four choices: Linear, Angular, Diameter, and Radius.
3. To go directly to the Linear menu, you simply press **(Alt) D**. This quick key bypasses the dimension choice menu and is faster to use.
4. Notice that the top two choices on the menu are Horizontal and Vertical. These are the most commonly used choices in the menu, as shown in Figure 5.4.

Use Quick Key!

Alt

D

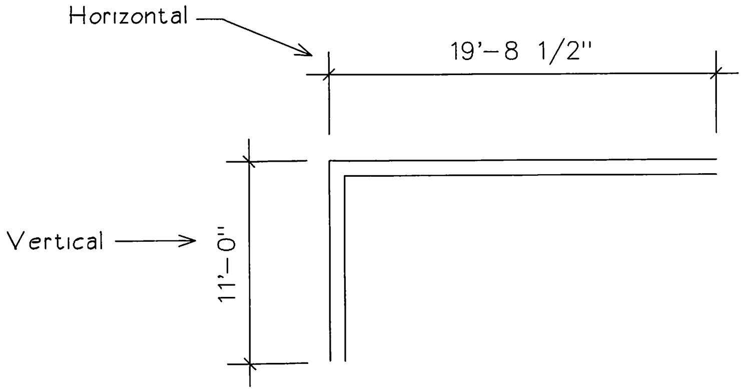


Figure 5.4: Horizontal and Vertical linear dimensions.

5. Pick the **Horizontal** option to make it active.
6. Make sure the **Assoc** option is also active. This means the dimensions are "associated", and will change automatically if you stretch a wall.

Note: By pressing the X key, you can turn on and off the grid snap. Turning it off for now will make it easier to object snap to the wall corners, while turning it back on to place your dimension will help you measure the distance from the building.

---

7. Object snap to the top left corner of your condo, as shown by step 1 in Figure 5.5.
8. Object snap to the next wall, as shown by step 2 in Figure 5.5.
9. Move your cursor up. The line you are dragging is the dimension line. You next pick indicates the distance from your building that your dimension will fall. Pick as indicated by step 3 in Figure 5.5.

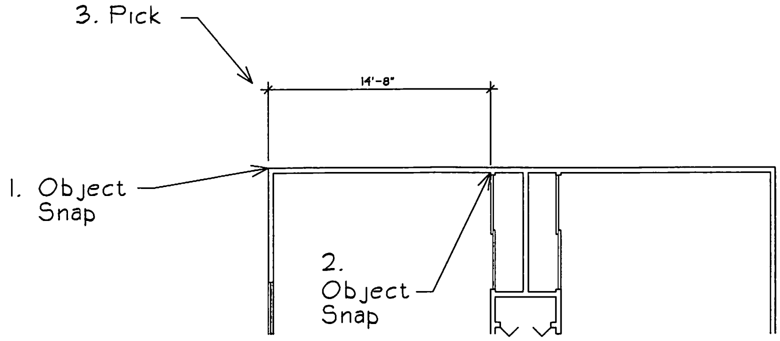


Figure 5.5: Creating your first dimension.

10. Now pick the **StrngLin** option. This option allows you to create continuous dimensions in a string.
11. Notice the message says: Select next point to dimension to. Object snap to the next corner, as shown in Figure 5.6.

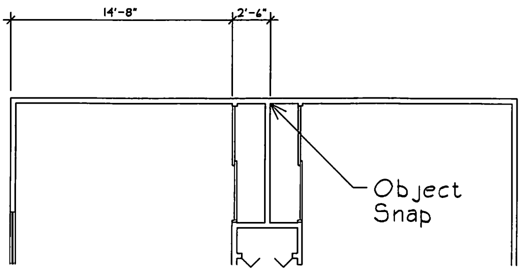


Figure 5.6: Creating the second dimension.

12. Object snap to the next corner, as in Figure 5.7.

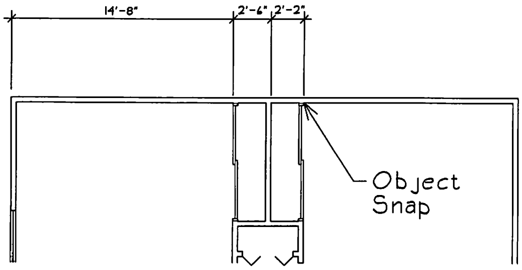


Figure 5.7: Creating the third dimension.

13. Now, object snap to the final corner, as in Figure 5.8.

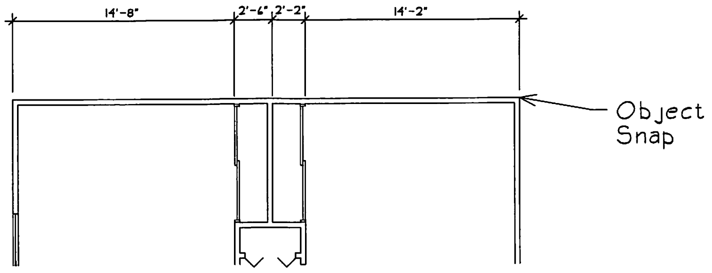


Figure 5.8: Creating the fourth dimension.

14. Press mouse button 3 to exit out of StrngLin.

Adding the second layer of dimensions

To create the overall dimension, you can use the Overall option, but it leaves little gaps in the extension line. So, instead, you will use a simple technique that works well for adding as many stacks as necessary to your dimensions.

1. Object snap to the actual tic mark of the first dimension, as shown in Figure 5.9.
2. Object snap to the last tic mark, as shown in Figure 5.9.
3. Pick to place the dimension, as in Figure 5.9.

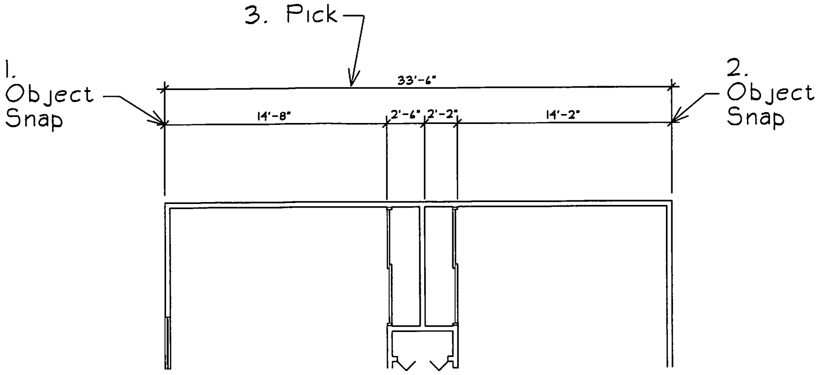


Figure 5.9: Creating a second level of dimensions.

If dimension text doesn't fit

What should you do if a dimension doesn't fit? You will know when this occurs because a message will appear that says: *Text does not fit. Enter new text position.* You then have 3 choices.

One is to try to make it fit, either make carefully positioning it with your cursor or by using the TextStyl option that appears to change the size or the aspect of your text. (An aspect of 1.2 would make your text skinnier.)

The second choice is to Rotate your text, typically by 90 degrees. This option will also appear when the text does not fit.

The third choice is to position the text outside of the dimension line and draw an arrow or arc back to the dimension. The following steps show two preferred ways to do this.

To draw the arrow:

1. When the text doesn't fit, the sub menu will appear prompting you to place your text.
2. Pick the **DrwLeadr** option.
3. Pick the middle of the dimension line, as shown as step 1 in Figure 5.10.
4. Pick to indicate the elbow of the arrow, as shown as step 2 in Figure 5.10.
5. Pick to indicate the position of the text, as shown as step 3 in Figure 5.10.
6. Press mouse button 3 to quit. The dimension and resulting arrow will appear.
7. Continue creating your dimensions.

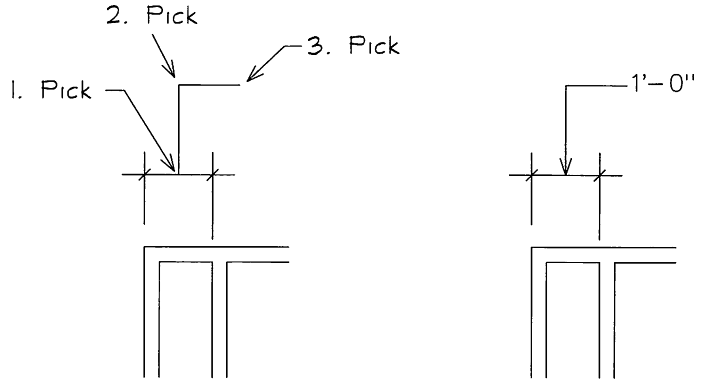


Figure 5.10: Using Draw Leader.

To draw the arc:

1. When the text doesn't fit, the sub menu will appear prompting you to place your text.
2. Pick to position your text, as shown by the first example in Figure 5.11. Notice the size of the box compared to the actual text size.
3. Once the text appears, continue creating your dimensions.
4. When you are done, press **(Alt) A** to go to **Curves** (Arcs).
5. Pick **3Pt Arc**.
6. Make sure **Dynamic** is active.
7. Object snap to the middle of the dimension line, as shown by step 1 in Figure 5.11.

Use Quick Key!

Alt

A

8. Pick to position the other end of the arc, as shown by step 2 in Figure 5.11.
9. Pick to create the curve of the arc, as shown by step 3 in Figure 5.11. (You may want to turn Orthomode off by pressing **O**.)
10. Continue creating any other arcs needed.

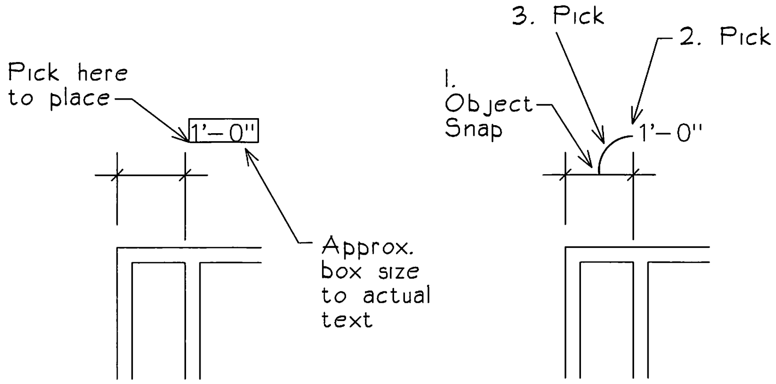


Figure 5.11: Adding an arc to the dimension.

Creating dimensions in a wall

Sometimes you must add a dimension where one extension line appears in the wall. This is illustrated in Figure 5.12. If you are using a laser printer, large format laser plotter, thermal or an electrostatic plotter, this line is usually hidden in the wall. However, if you use a pen plotter, this line will probably shown up as a darker line in your wall. If you have a pen plotter, then, you probably won't want that extra line.

When you are using associated dimensions, the dimension is treated as a single entity, so you can't erase one of the lines in the dimension. Turning off an extension line, or even both, is possible by using the toggles for extension line 1 and line 2 found in the Dim Styl menu.

1. Pick the **Dim Styl** option in the Dimension, Linear menu.
2. Pick Line 1 until it is turned off (red).
3. Press mouse button 3 to exit the menu and return to the Linear menu.
4. Object snap to the wall, shown as step 1 in Figure 5.12. This will be extension line 1.

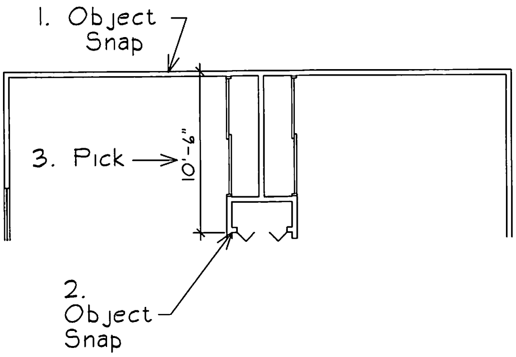


Figure 5.12: Turning off the first extension line.

4. Object snap to the corner, shown as step 2 in Figure 5.12. This will be extension line 2.
5. Pick to position the dimension line, shown as step 3 in Figure 5.12. The first extension line will be turned off.
6. Following the same procedure, as outlined in Figure 5.13, object snap to the outside wall by the Master bedroom, shown as step 1.
7. Object snap to the corner of the angled wall, shown as step 2 in Figure 5.13.
8. Pick to place the dimension. The first extension line is turned off!

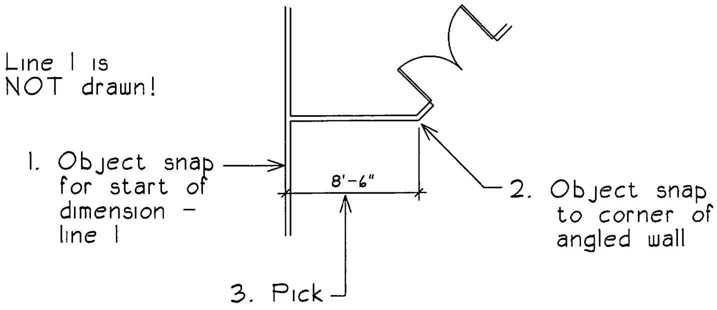

Line 1 is NOT drawn!
1. Object snap for start of dimension - line 1
8'-6"
2. Object snap to corner of angled wall
3. Pick

Figure 5.13: Repeated steps for turning off extension line 1.

9. Pick the **StrngLin** option.
10. Object snap to the next corner and the next hallway corner, as shown in Figure 5.1 at the beginning of this chapter.
11. When you are done, pick **Dim Styl** and turn **Line 1** back ON!

Another way is to "unassociate" your dimension. The problem with this is that you can't re-associate it. An unassociated dimension will not change automatically if you stretch a wall. However, you have the ability to "lie" about a wall length, or to even type in something like "See Plan A" as the dimensions!

To see how this works, follow the next steps.

1. Pick **Assoc** until it is NOT active (red).

2. Object snap to the inside wall corner of the closet, as shown as step 1 in Figure 5.14. This will be extension line 1.

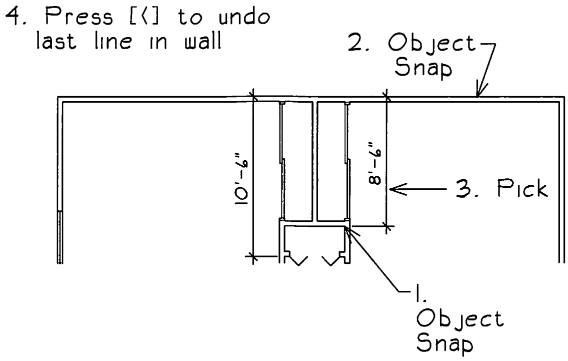


Figure 5.14: Erasing an extension line in non-associated dimensions.

3. Object snap to the wall, shown as step 2 in Figure 5.14. This will be extension line 2, and the last extension line.
4. Pick to position your dimension line, shown as step 3 in Figure 5.14.
5. Notice the dimension is displayed in the message area of your screen. This is the time you could type in a different dimension or even a reference note. To accept the present dimension, press (Enter). The dimension is created.
6. Now press the **(<)** key (remember, do not press the (Shift) key unless told to). The last extension line will erase!

Use Quick Key!

<

7. Make sure you pick the **Assoc** option to make it active again.
8. Continue adding all of your dimensions, using Vertical or Horizontal as necessary. Remember to use the previous hints if needed.
9. Using the techniques learned in Chapter 4 , add the room labels to your drawing. (See Figure 5.15.)

   Hints:

   Use **(Alt) T** to go to the Text menu.

   Make sure **Dynamic** is active.

   Change the **Size** of your text to 1'-0". This will be 1/4" text when plotted at 1/4" scale.

   Turn the Justify to **Center** if you want to center the text.

Use Quick Key!

Alt

T

Use Quick Key!

Shift

F

10. Press **(Shift) F** to save your file. If you still have (Caps Lock) on, just press F, then **turn (Caps Lock) OFF**.

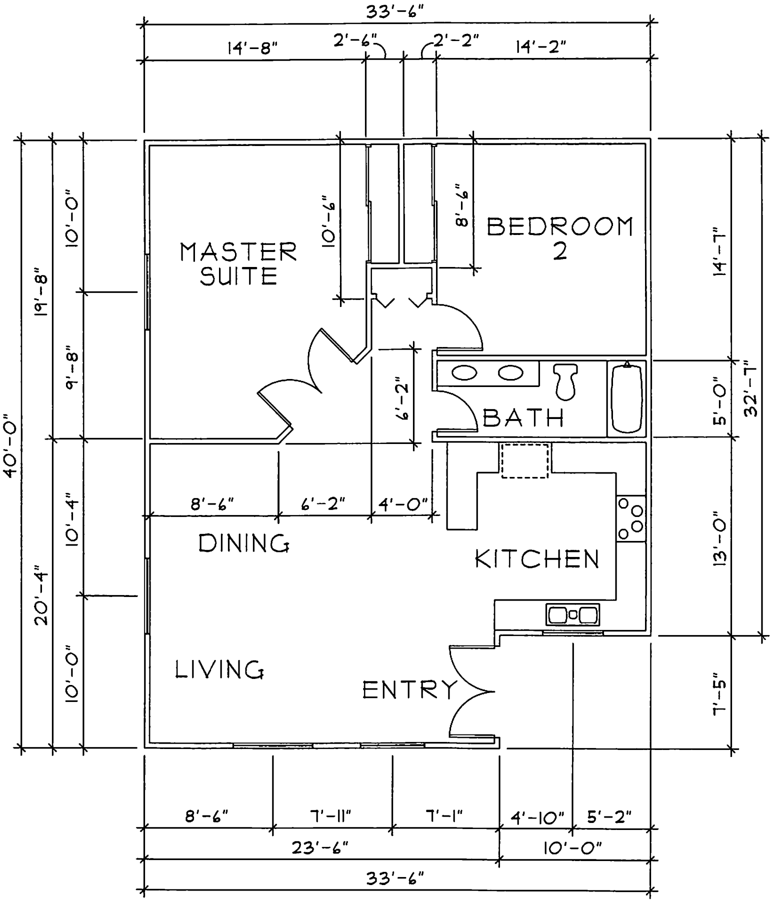


Figure 5.15: Dimensions and room labels added to your drawing.

Outlining the tile

The first pattern you will add is the floor tile in the kitchen and entry areas. First you will draw the tile floor lines.

Use Quick Key!

O

Use Quick Key!

=

1. Press **(Tab)** to make the **Hatch** layer active.
2. Make sure orthomode is on (Sw**O**THLUD). Just press the **O** key to turn it on.
3. Make sure that Walls is off (**Sw**OTHLUD). Just press the **(=)** wall key to turn it off.
4. Object snap to the corner of the counter and draw a straight line coming out, as shown in Figure 5.16, and pick.
5. Press mouse button 3 to let go of the line.
6. Object snap to the other end of the counter and draw a second line that crosses the first. (If they don't cross, don't worry! But they should look similiar to Figure 5.16.)
7. Repeat the process in the entry way, as in Figure 5.16.

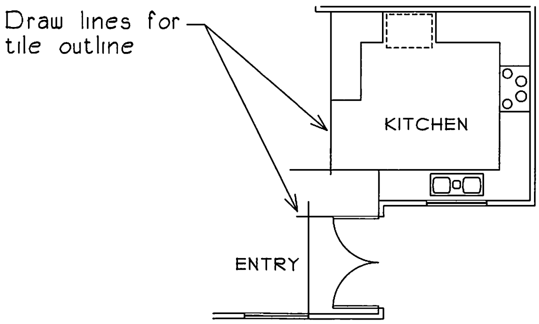


Figure 5.16: Draw tile outline.

Use Quick Key!

Alt

J

8. Press **(Alt) J** to go to **2 line trim** in the Cleanup menu. (You can think of it as **J**oin 2 lines to remember (Alt) J.)

9. Pick the first line on the side you want to keep, as shown as step 1 in Figure 5.17.

10. Pick the second line on the side you want to keep, as shown as step 2 in Figure 5.17. The excess line ends will be erased. If your lines were drawn short, this same technique will work to extend them out to each other.

Remember to pick on the correct spot of the line to indicate the side of the line you wish to keep!

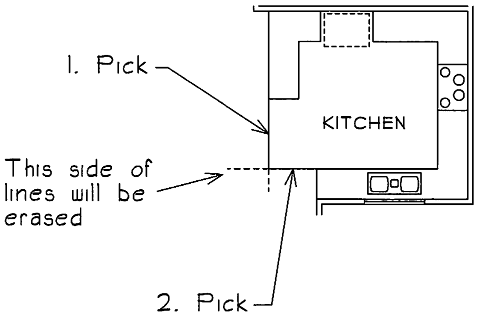


Figure 5.17: Joining two lines for the kitchen tile with 2 line trim.

11. Trim the two lines that make up the entry area, as shown in figure 5.18.

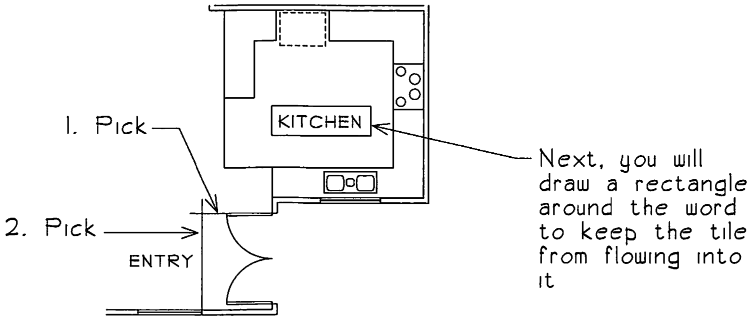

1. Pick
KITCHEN
2. Pick
ENTRY
Next, you will draw a rectangle around the word to keep the tile from flowing into it

Figure 5.18: Joining two lines in the entry with 2 line trim.

You will want to draw an outline around the word KITCHEN. This will help you to keep the tile hatch from running into the word! The quickest way is to draw a simple rectangle.

Use Quick Key!

Alt

R

1. Press **(Alt) R** to go to the Polygons menu.
2. Make sure **RectAngl** is active. You can draw a rectangle as easy as drawing an area around something to erase!
3. Make sure **CntrPnt** is OFF. This option creates a little centerpoint in the middle of the rectangle, which is not necessary now.
4. Pick at the lower left hand corner of the word kitchen.
5. Move the cursor. Notice that a rectangle is connected to your cursor. Drag the rectangle around the word KITCHEN and pick to place it. See Figure 5.18.

Adding Hatch Texture Patterns

You can use the 8" x 8" floor tile for the first pattern.

Use Quick Key!

H

1. Press **H** to go to the Hatch menu.
2. Make sure **Associat** is active. This will make is very easy to modify your hatch later.
3. Pick the **Pattern** option.
4. Pick **NextPage** once or twice until you see the **8x8 til** pattern. If you go too far (they are in alphabetical order), pick **PrevPage**.

Notice: A preview box appears with a preview window. Try placing your cursor over the pattern names. A picture of the pattern will appear.

---

5. Pick the **8x8 Til** pattern.
6. Pick **Scale**.
7. Type in **1** to create the pattern at the true scale (8" x 8" tile squares). Press (Enter).
8. Pick **Boundary**. This option allows you to pick a boundary, or fence, for your hatch area.
9. Object snap to the corners of the kitchen tile area and the corners of the rectangle around the word KITCHEN, as shown in Figure 5.19.

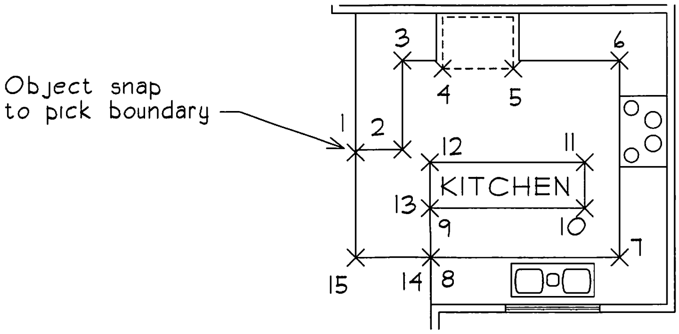


Figure 5.19: Object snap to the corners.

10. After you grab the last the last corner, shown as step 15 in Figure 5.19, press mouse button 3 to **Close** the boundary.
11. Pick **Begin**. The hatch will appear.

Modifying your hatch

Now you will notice a couple of things. Perhaps the tile is too small or the hatch is not starting at a preferred spot, as shown in Figure 5.20. (The scale of the hatch has been enlarged for illustration purposes.) For example, you may want a 12" tile, with a whole tile starting in the corner.

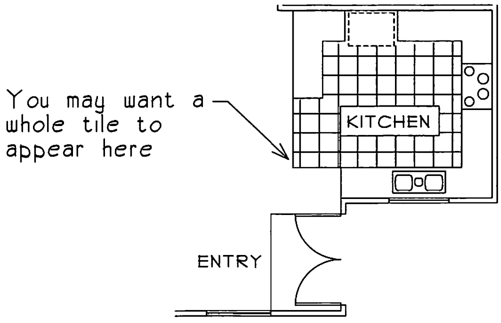


Figure 5.20: You can modify the tile.

1. Pick **Entity** to make it active.
2. Pick the tile hatch until it is grey and dashed, indicating it is selected.
3. To change your tile start point, pick **Origin**.
4. Object snap to the corner indicated in Figure 5.21.

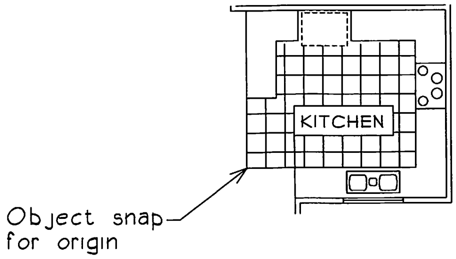


Figure 5.21: Changing the origin point of your tile.

5. Pick **Begin**. The tile will be redrawn to the new origin.

Note: *Sometimes when a hatch boundary corner is crossing a hatch line, the hatch line may be turned off. This symptom will appear as missing lines in your hatch, in this case tile. If this happens to you, you can easily fix it. Simply use the* ***Origin*** *option and "free pick" (no grid snap or object snap) to define the start point. This technique will move the origin just slightly so that it doesn't coincide exactly with a corner.*

---

6. Repeat the same technique to change the tile to **12x12 Til** if you wish -

   Pick the tile hatching to make it active.
   Pick **Pattern**.
   Pick **12x12 Til**.
   Pick **Begin**.

To turn off the hatch boundary

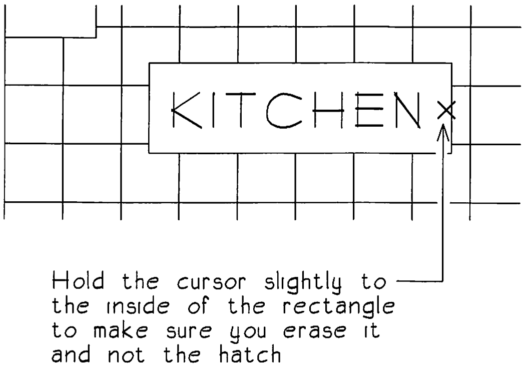
Once you have finished your hatch, you will want to turn off the boundary.

Use Quick Key! H

1. If you have left the Hatch menu, press **H**.
2. If your hatch is no longer active, pick the hatch you wish to operate on. In this case, the kitchen tile hatch.
3. Pick the **HtchType** option. Notice that this menu is called Associat. This means you are in the Hatch Type option when an *associated hatch* is active.
4. Pick **NoOutLin** until it is active.
5. Press mouse button 3 to Exit the menu and return to Hatch.
6. Pick **Begin**. the boundary will turn off! (Begin will only be displayed if a boundary or hatch is active.)
7. Press the (Esc) key to refresh your screen. Notice the rectangle you drew around the word Kitchen is still there.

Use Quick Key! E

8. Press **E** to go to the Erase menu.
9. Pick **Group** until it is active.
10. Hold your cursor slightly to the inside of the rectangle, as shown in Figure 5.22. Holding it slightly to the inside will force the cursor to see the outline before it sees the actual hatch.
11. Pick to erase the rectangle.



Hold the cursor slightly to the inside of the rectangle to make sure you erase it and not the hatch

Figure 5.22: Pick to erase the outline.

Use Quick Key! H

1. Create a tile pattern for your entry. You can use either tile and you can define a origin *before* the hatch is created if you wish. (See figure 5.23.)

   H is the quick key for Hatch.
   Use **Boundary** to define the area of the hatch.
   Use **HtchType**, **NoOutLin** to turn off the outline of your hatch. (The original outline you drew will still be displayed.)

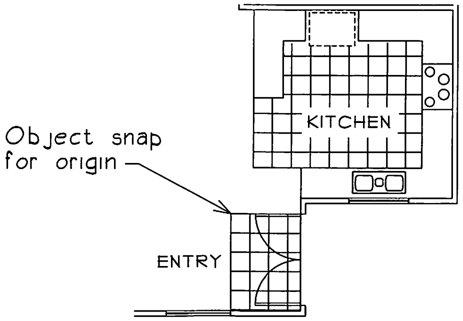


Figure 5.23 Create the entry tile.

Creating the front porch slab

1. Press mouse button 3 to exit from Hatch.
2. Create a slab outline for the front porch area, as indicated in Figure 5.24.

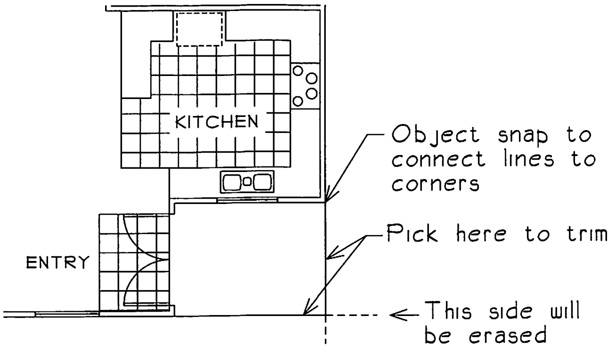


Figure 5.24 Create the porch outline.

Use Quick Key! **Alt** **J**

Use Quick Key! **H**

3. Use **(Alt) J** to Trim your lines.
4. Press **H** to go to **Hatch**.
5. Pick **Pattern**.
6. Pick **Concrete** as your new pattern.
7. Pick **Scale**.
8. Type in **90** and press (Enter).
9. Pick **Boundary**.
10. Object snap to the four points of your porch slab, as shown in Figure 5.25.

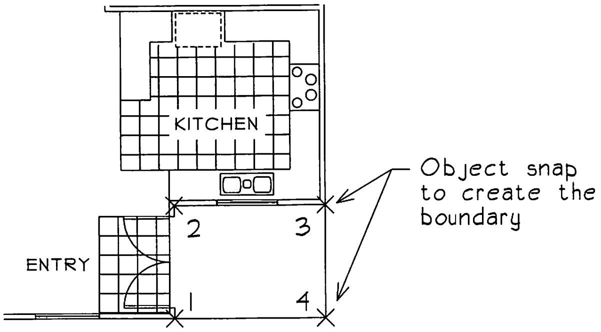


Figure 5.25: Object snap for your boundary.

11. Press mouse button 3 to Close your boundary.
12. Pick **Begin**.
13. Look at your concrete pattern. Is it too big? to change the size, pick **Scale**.
14. Type in **40**. Press (Enter).
15. Pick **Begin**. The texture hatching will change scale.
16. Your drawing will look similiar to Figure 5.26 (although the scale has been changed so that you can see it better).

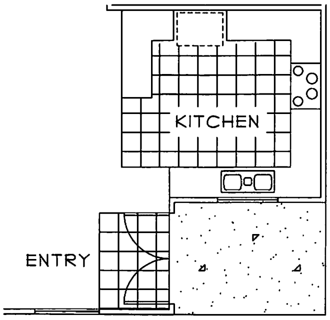


Figure 5.26: The finished hatch for tile and concrete.

Use Quick Key!

Shift

F

17. Press **(Shift) F** to File your drawing.

Chapter summary

During this chapter, you have learned:

To turn off a layer when it is not necessary to have it displayed, by using Layers, On/Off.

How to create vertical and horizontal dimensions.

Techniques to turn off extension lines.

Simple ways to place text when it does not fit in a dimension.

How to stack dimensions.

Dimensions are created in a certain order: the smallest dimensions (windows & openings) first, the next larger (exterior & interior walls) second, and the largest (overalls) last.

Each dimension level builds on itself like a "stack" by object snapping to the tic marks.

Hatch is used to create textured patterns in your drawings.

Associated hatch is easy to modify.

The size and start point of the hatch can be defined.

There are many different patterns available for hatching.

CHAPTER 6

Creating Your Own Symbols

Although DataCAD comes with a variety of symbols, there will be many more you will want to make to customize the system. The first symbols you will make are for your foundation plans. Figure 6.1 shows the foundation plan for the entire condo project.

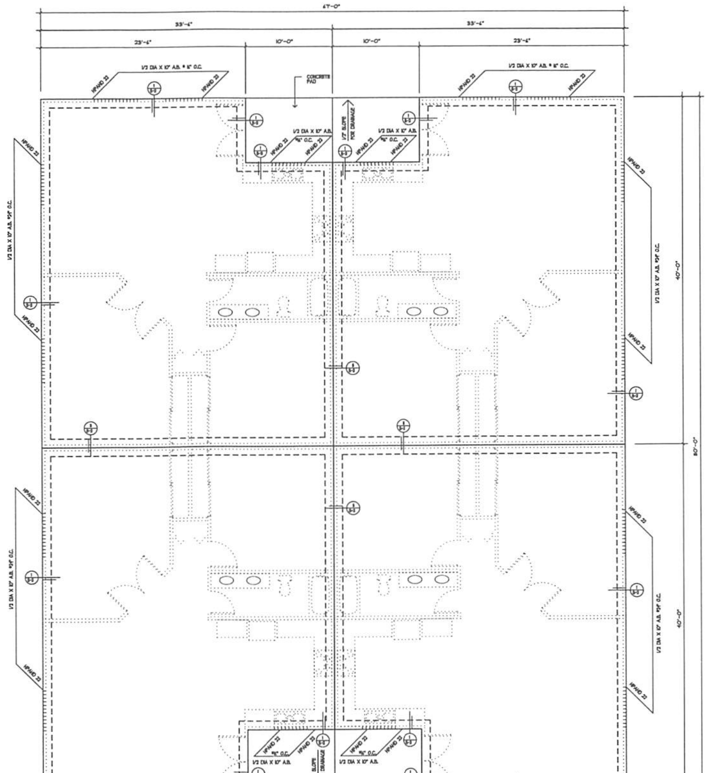


Figure 6.1: The foundation plan for the condo project.

Showing the floor plan layers

One of the steps for this particular foundation plan is to show the floor plan in a dotted line. This is a quick and easy way to show the plan as a background, bringing the foundation lines and notes to attention.

However, if you are using a pen plotter for your final output, a very large dotted floor plan would take extremely long to plot. An alternative might be to use a green pen to draw the background floor plan. The ink fades out in a blueprint.

For this small exercise, you can use the dotted background.

Use Quick Key!

L

1. Press **L** to go to the Layers menu.
2. Pick **On/Off**.
3. Pick the layers you wish to turn OFF until they are inactive (the function key number is red): **Dims, Notes, Elec, Hatch, Border**. They will be turned off on your screen as you pick them.
4. Make sure the layers you wish on are active (the function key number is green): **Walls, Doors, Windows, Cabinet, Plumb**.
5. Press mouse button 3 to Exit the On/Off menu.
6. Pick the **NewLayer** option.
7. Type in **3** and press (Enter). 3 new layers will be created.
8. Pick the **Name** option.
9. Pick the first new layer you created (they will be numbered, ex. LAYER11, LAYER12, etc.).
10. Once the layer number appears at the message area of the screen, type in the name: **DottedFl** and press (Enter). This layer will hold the dotted floor plan.
11. Pick the next new layer you created.
12. Once the layer number appears at the message area of the screen, type in the name: **Foundatn** and press (Enter). You will add the foundation lines and notes to this layer.
13. Finally, pick the last new layer you created.
14. When the layer number appears at the message area of the screen, type in the name: **FoundHch** and press (Enter). You can use this layer to hold the hatch for the foundation.
15. Press mouse button 3 to Exit the Name menu.
16. Press **(Tab)** to until the Foundatn layer is active so that you can assign a color to it. (You won't have to worry about a color for the DottedFl layer - you only copy items to it.)
17. Pick **Color** and set it to **Yellow**. (You could also press the **K** key until the active color was green.)

Use Quick Key!

K

18. Press **(Tab)** to go to the FoundHch layer.
19. Pick **Color** and set it to **Blue**. (Again, you could also press the **K** key until the active color was green.)

Copying from layer to layer

You will copy the floor plan layers into one layer for dotting.

Use Quick Key!

C

1. Press **C** to go to the Copy menu.
2. Pick the **To Layer** option.
3. Pick the layer called **DottedFl**.
4. Make sure the **Area** and **LyrSrch** options are active.
5. Indicate a box around the entire floor plan, as in Figure 6.2. Everything will be copied to the DottedFl layer, and a message will be displayed telling you how many entities were copied.

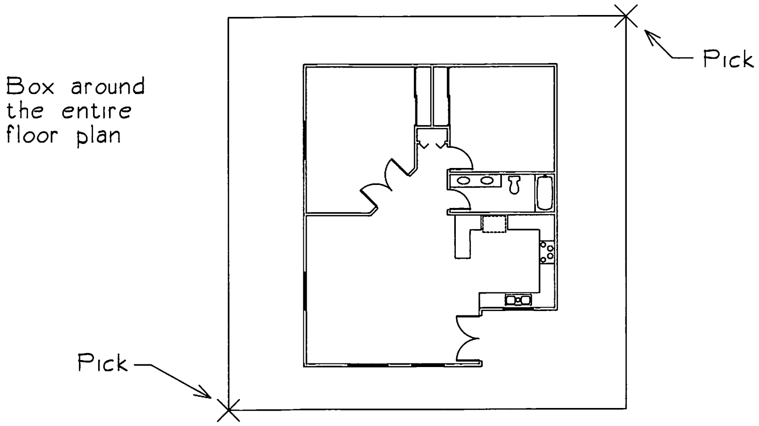


Figure 6.2: Box around the whole plan.

Now you will want to turn off the floor plan layers and on the layers you want to work with.

Use Quick Key!

L

1. Press **L** to go to the Layers menu.
2. Pick the **ActvOnly** option.
3. Pick the layer called **DottedFl**. All of the other layers will turn off.
4. Press mouse button 3 to Exit.
5. Pick the **On/Off** option.
6. Pick the layers called **Foundatn** and **FoundHch** to turn them on.
7. Press mouse button 3 to Exit the menu.

Changing the floor plan to dotted

Use Quick Key!

Alt

C

1. Press **(Alt) C** to go to the Change menu.
2. Pick the **LineType** menu.
3. Pick the **Dotted** option.
4. Now pick **Spacing** to adjust the dot pattern.
5. Type in **.3** and press (Enter). Once changed, the lines will have dots repeated every 3 inches.

Use Quick Key!

Shift

F

16. Keep **LyrSrch** OFF. This way, you will not pick a line of your floor plan by accident.
17. Pick all of the inside lines of the foundation to make them dashed, as shown in Figure 6.5.
18. Press **(Shift) F** to File save your drawing.

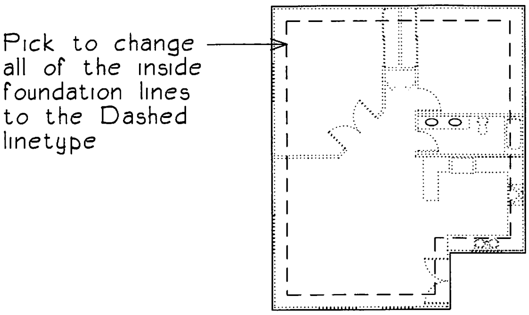

Pick to change all of the inside foundation lines to the Dashed linetype

Figure 6.5: Make the inside foundation lines dashed.

Creating the four-plex

Your condo is part of a four-plex, meaning that there are four condos connected to each other. You will want to show the rest of the layout in order to correctly call out the footing details for the party walls.

Use Quick Key!

Alt

M

1. Press **(Alt) M** to go to the Mirror menu.
2. Object snap to the upper left corner of the exterior wall to define the first point of your mirror line. This is shown as step 1 in Figure 6.6.
3. Making sure Orthomode is on (press O if it isn't), drag out a horizontal line and pick, as in step 2 in Figure 6.6.

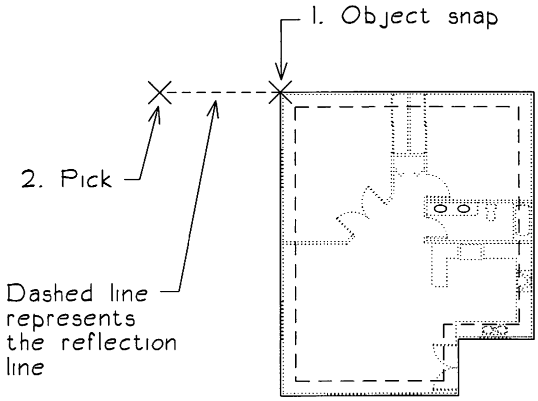


Figure 6.6: Define the reflection line for mirroring.

4. Pick the **AndCopy** option until it is active.
5. Make **Area** and **LyrSrch** active.
6. Indicate a box around the entire floor plan again. The copy is made, mirrored from the original! See Figure 6.7.

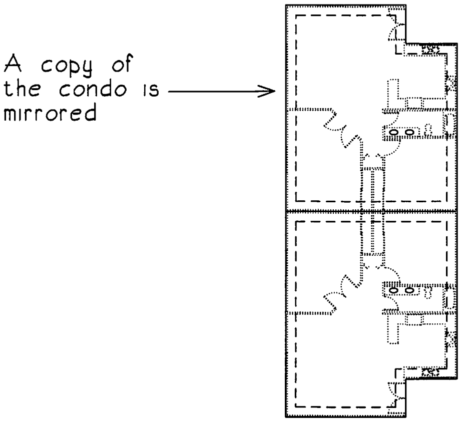


Figure 6.7: The mirrored plan is made.

7. Pick the **NewLine** option.
8. Object snap to the lower right corner start a new reflection line, as shown as step 1 in Figure 6.8.
9. Drag a vertical line straight out, and pick as shown as step 2 in Figure 6.8.

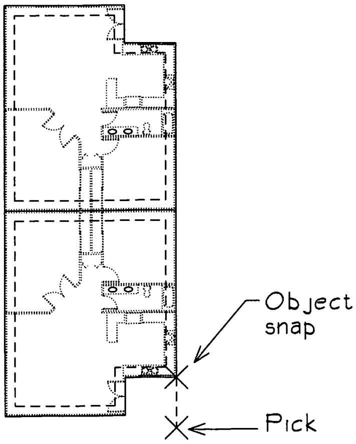


Figure 6.8: Defining a new reflection line for mirroring.

10. Box around both condos as shown in Figure 6.9. (You may need to use (Page Up) to see both condos, or pick the **Out button** in the control panel.)

***Note:** The **Out** and **In buttons** in the control panel act as Page Up (Out) and Page Down (In).*

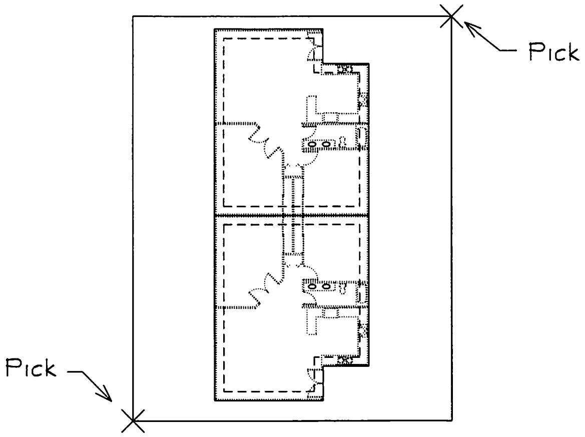


Figure 6.9: Capture both condos when indicating the box.

Use Quick Key!

Shift F

11. The four-plex is made! (See Figure 6.10.)
12. Press **(Shift) F** to File save your drawing.

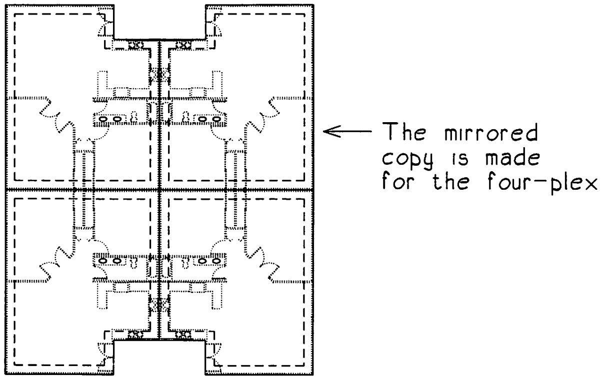


Figure 6.10: The four-plex foundation.

Creating the first footing symbol

The first symbol you will make is a footing detail call-out.

1. Use the W button in the control panel to "window-in" to a clean area of your drawing. This will make it easier to draw the symbol.

   Pick the **W button.**
   Pick two diagonal points to zoom into, as shown in Figure 6-11.

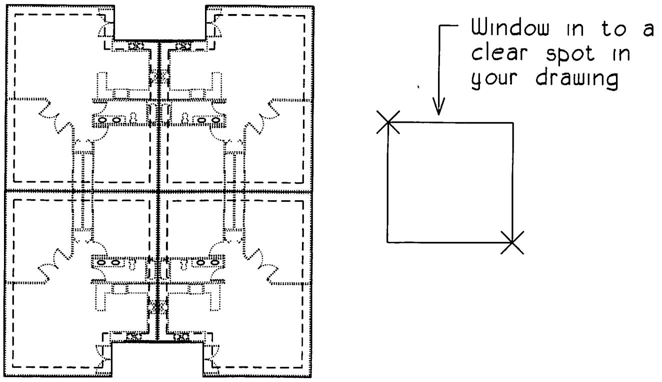


Figure 6.11: Windowing into a clean area to draw in.

Drawing the circle

Use Quick Key! **=**

Use Quick Key! **X**

Use Quick Key! **Alt** **A**

1. Press the **(=)** wall key to toggle the Walls OFF.
2. Make sure your grid snap is ON (**S**wOTHLUD). If it isn't, press the **X** key until the message says "Snapping is ON".
3. Press **(Alt) A** to go to the Curves menu (Arcs).
4. Pick **DiaCirc**.
5. Pick a start point on your screen, as shown in Figure 6.12.
6. Wiggle your cursor. Notice how there is a circle attached to your cursor. If you don't see the circle, the Dynamic option is off. To see a circle, pick **Dynamic** to make it active.

Note: *The Dynamic option is a global switch. In other words, if you turn it on in the DiaCirc menu, it will now be on in the other curve functions. It is also linked to some other menus, such as Offset and 3D Views, SetPersp. However, it is not linked to the Rotation or Text menus.*

---

7. Press the **(Spacebar)**.
8. Type in **1.6** in the X direction, and press (Enter). Once plotted at a 1/4" scale, this circle will be 3/8".
9. Press (Enter) to accept **0** in the Y. The circle is created, as shown in Figure 6.12.

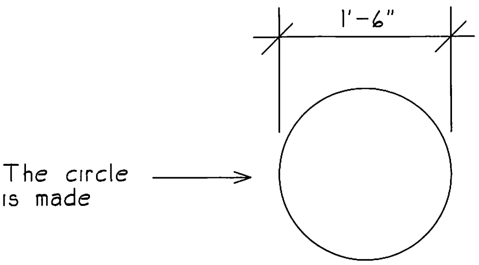


Figure 6.12: The circle for the footing call-out.

Drawing the lines

Use Quick Key!

Shift

X

1. To draw the lines for the symbol, you will want to object snap to side points on the circle. To do this easily, you can use a special object snap setting for circles and arcs called Quadrant. Press **(Shift) X** to go to the Object snap menu.
2. Pick **Quadrant** to make it active. This option divides the circle into 4 snapping points at the 12, 3, 6, and 9 o'clock positions.
3. Draw a line by object snapping to points 1 and 2 shown in Figure 6.13.

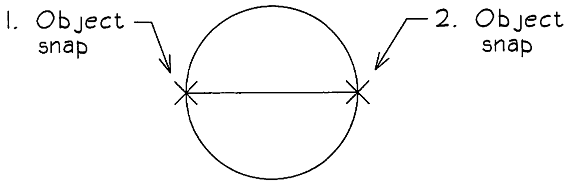


Figure 6.13: Object snapping to the quadrant points of the circle.

4. Press mouse button 3 to quit the line.
5. Object snap to the bottom point of the circle, as shown in Figure 6.14.
6. Press the **(Spacebar)**.
7. Press (Enter) to accept **0** in the X direction.
8. Type in **-2.6** and press (Enter) for the Y direction.
9. Press mouse button 3 to quit the line.
10. Draw a short line 2" away from the first line, about 1'-0" long, as shown in Figure 6.14.
11. Press mouse button 3 to quit the line.

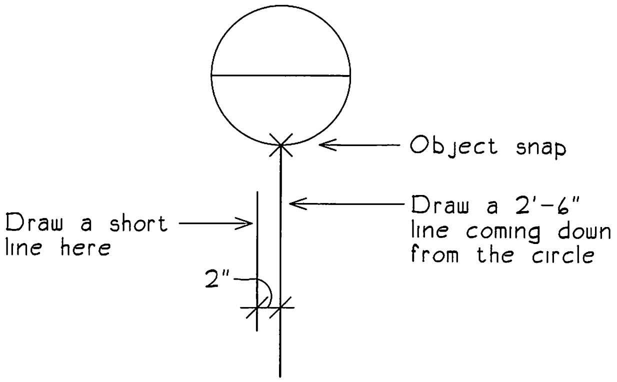


Figure 6.14: Drawing the lines for the symbol.

Use Quick Key!

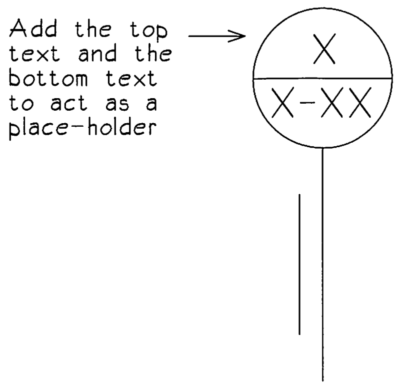
Alt

T

Adding the text

1. Press **(Alt) T** to go to the Text menu.

2. Pick the **Size** option.
3. Type in **.5** and press Enter. A 5" letter will plot slightly smaller than 1/8" at 1/4" scale.
4. Pick **Aspect**.
5. Type in **1.3** and press Enter. This setting will make your letters a little narrower and easier to fit in the circle.
6. Pick **Left** to set the justification. (It is easier to work with Left justify on when typing in text in small places.)
7. Pick to place the start of the top number, as shown in Figure 6.15.
8. Type in **X** and press Enter. This will be the number placeholder.
9. Press mouse button 3 to quit the paragraph.
10. Pick to place the start of the bottom text, as shown in Figure 6.15.
11. Type in **X-XX** and press (Enter).
12. Press mouse button 3 to quit the paragraph.



Add the top text and the bottom text to act as a place-holder

Figure 6.15: Adding the text to your symbol.

Creating the new template

You could save your new symbol to an existing template, but since this is a new type of symbol (Foundation), you will want to create a new template to hold all of your foundation symbols.

Use Quick Key!

T

1. Press **T** to go to the Template menu.
2. Pick the **New Path** option.
3. Type in **tpl\flrplns** and press Enter.

   This will be the new path for all of your own symbols you add to floor plans. These might be usual floor plan symbols, such as sinks, tubs, stoves, etc., as well as sheets that go on your floor plans, such as HVAC, foundation, electrical, framing, etc. This will eliminate changing paths for templates all the time.
4. The message will read: *Path 'TPL\FLRPLNS\' does not exist. Create it?* Pick **Yes** to create the path.

5. Now type in the new name of your template: **foundatn** and press Enter.
6. The message will tell you this template does not exist. Pick **Yes** to create it.
7. You will be prompted to enter a field name for Field 7. You might do this if you were customizing a report for later use. Since you will not be doing this for now, press mouse button 3 to exit.
8. The template will appear. Notice that there are 3 boxes across the template, and 9 boxes going down. This is the division default. You can easily change this at any time.
9. Pick the **Divisons** option.
10. Type in **2** and press Enter for the number of boxes in the X direction.
11. Type in **7** and press Enter for the number of boxes in the Y direction.
12. Now there will be 14 boxes displayed, as in Figure 6.16.

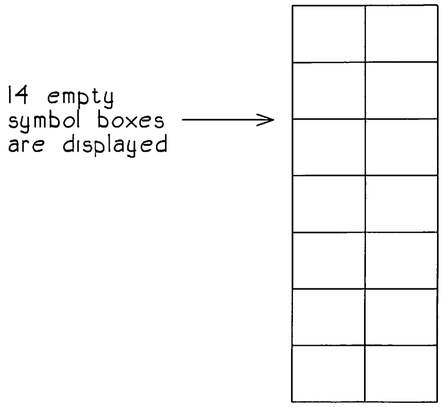


Figure 6.16: Adjusting the template box divisions.

Saving the symbol

1. Pick the **SaveSymb** option.
2. Check the pathname for your symbol. It should be sym\foundatn. If it isn't:

   Turn off **AutoPath**.
   Pick **NewPath**.
   Type in **sym\foundatn** and press Enter.
3. Type in the DOS name for your symbol file: **ftg-up** and press Enter. The name will define a footing symbol in an "upright" position.

Note: *Remember, when typing in a DOS filename, you are limited to 8 characters and are allowed no spaces. Also, refrain from using any special characters, other than a dash.*

---

4. Make sure **Area** is active.

5. Box around the entire symbol. It will become grey and dashed to indicate it is selected.
6. Now you are prompted to *Select the reference point for symbol.* Object snap to the end of the short line, as shown in Figure 6.17.

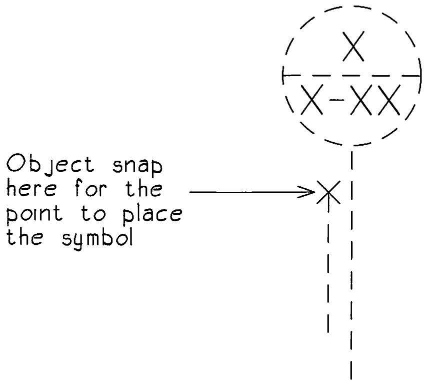


Figure 6.17: Object snap for the reference point.

7. The graphics will disappear off your drawing and reappear in the first box of the template, as in Figure 6.18.

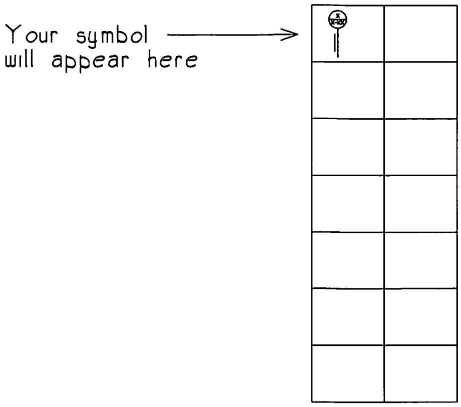


Figure 6.18: The symbol appears in the first box.

8. Now you are prompted to enter an item name. Type in **Footing Symbol Up** and press Enter. This name will appear when your cursor is placed over the symbol box in the template. It will also be used in the template report.
9. Next, you are prompted for the manufacturer. This might be applicable for another symbol set, but not for this one. Press mouse button 3 twice to exit and return to the Template menu.

Modifying a symbol to make more symbols

To modify an existing symbol, it must be exploded. This way, DataCAD sees it as editable lines and circles, etc. If it was not exploded, the symbol is a single entity in the drawing file and cannot be changed as individual items. (This happened earlier when you tried to change the linetype of the floor plan to dotted, and the symbols wouldn't change until you exploded them.)

You can explode a symbol as you bring it out from the template.

1. Pick the **Explode** option in the Template menu until it is active.
2. If **DymRot** has been turned off, pick it to make it active also.
3. Pick the symbol in the template box.
4. Pick once to place the symbol in your drawing.
5. Move the cursor **down** vertically (-Y) on your screen. You will want to make sure Orthomode is ON (Sw**O**THLUD) so that your symbol stays in an exact 90 degree rotation.
6. Pick to position you symbol. It should look like Figure 6.19.

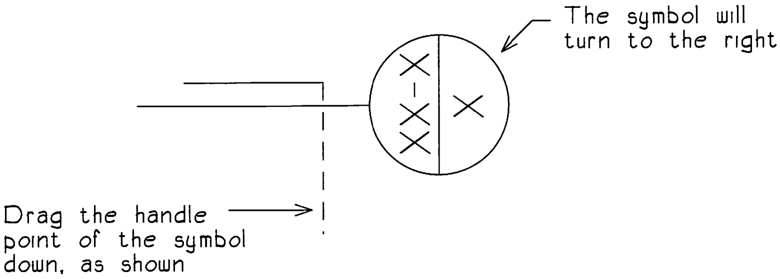

The symbol will turn to the right
XX-X
X
Drag the handle point of the symbol down, as shown

Figure 6.19: The symbol is rotate 90 degrees to the right.

7. Pick once to place the next symbol.
8. Drag the handle of this symbol to the left and pick to position it. Now the symbol should be upside down, as in Figure 6.20.

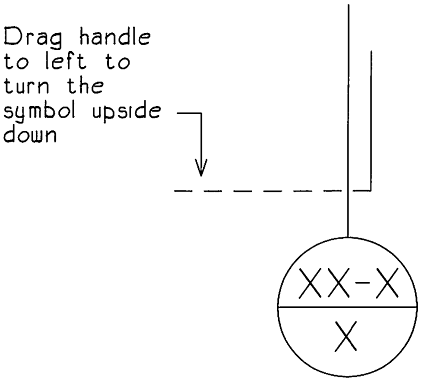


Figure 6.20: The symbol is rotated 180 degrees upside down.

9. Pick again to place a third symbol.
10. Drag the handle up vertically and pick to position it. The symbol will be on its left side, as in Figure 6.21.

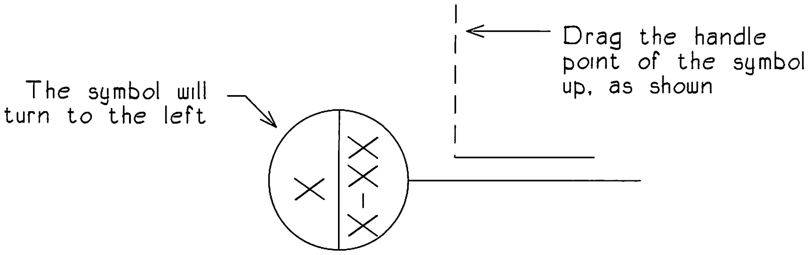

The symbol will turn to the left
Drag the handle point of the symbol up, as shown

Figure 6.21: The symbol should be on its left side.

Rotating the symbol text

The new symbols must have the circle text and line rotated before adding them to your template.

Use Quick Key! R

1. Press **R** to go to the Rotate menu.
2. You will be prompted to enter a rotation center point. Object snap to the midpoint of the line in the circle of the first symbol, shown in Figure 6-22.

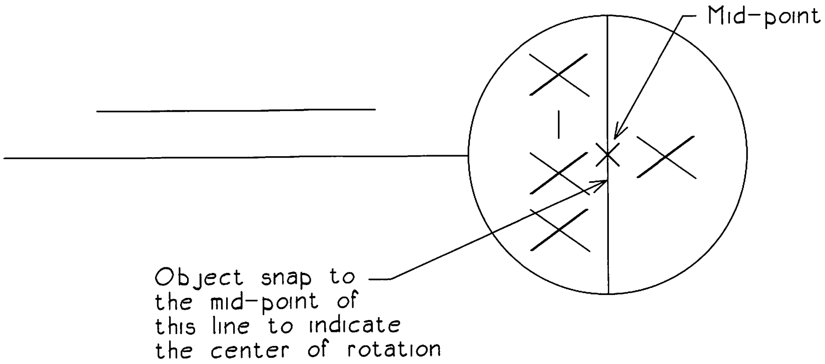

Mid-point
Object snap to the mid-point of this line to indicate the center of rotation

Figure 6.22: Object snap for the rotation center point.

3. Pick the **NewAngle** option.
4. Type in **90** and press (Enter).
5. Pick **Dynamic** until it is OFF.
6. Make sure **Area** is active.
7. Indicate a box around the circle, as shown in Figure 6-23. The text and the line will rotate. (Of course, the circle does too, but you can't see the difference.)

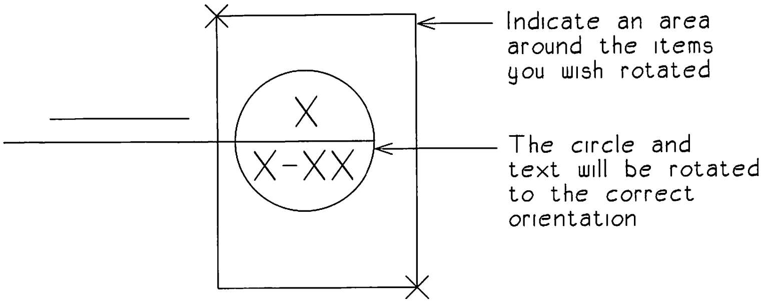

X
X-XX
Indicate an area around the items you wish rotated
The circle and text will be rotated to the correct orientation

Figure 6.23: Box around the circle to capture the text and the line.

1. To rotate the next symbol, pick **NewCentr**.
2. Object snap to the midpoint of the line in the circle of the next symbol, as shown in Figure 6-24.

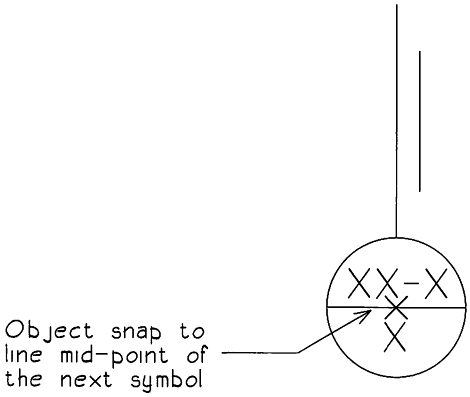


Figure 6.24: Object snap for the next center point.

3. This time, turn **Dynamic** ON. This option allows you to dynamically rotate the items using a handle (like DynmRot in the template menu).
4. Box around the circle of the second symbol, as in Figure 6-25.

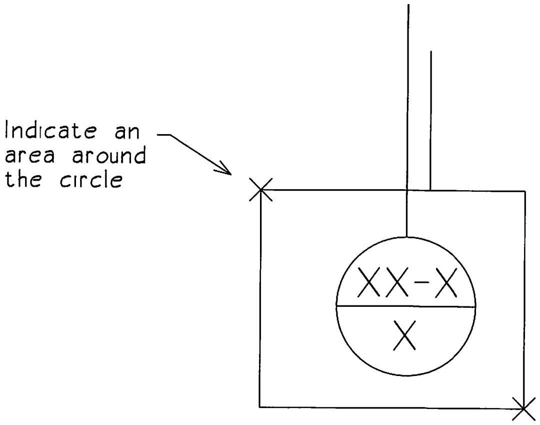


Figure 6.25: Box around the circle area.

5. Now, object snap to the end of the line in the circle, as shown in Figure 6.26. This will be your "point to rotate by", or in other words, your handle point.

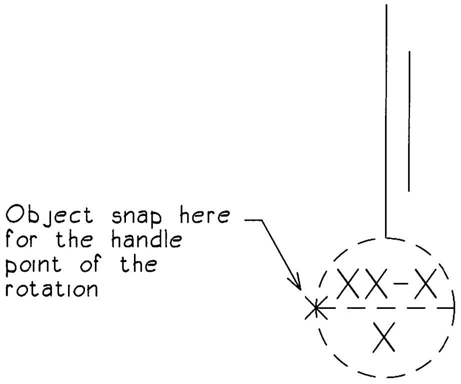


Figure 6.26: Object snap for your handle point.

6. Move your cursor around. Notice the items you boxed around to rotate are moving as you move the cursor.
7. Pick over to the right, as shown in Figure 6.27. This will turn the text and line over to the correct position.

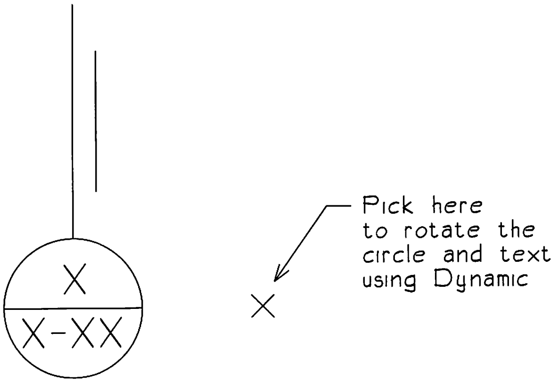


Figure 6.27: The text and line are rotated.

1. To modify the last symbol, pick **NewCentr**.
2. Object snap to the midpoint of the line in the circle of that symbol, as shown in Figure 6.28, step 1.
3. Indicate the area to rotate, as in step 2, Figure 6.28.
4. Object snap to the end of the line as a rotation handle, as in Figure 6.28, step 3.
5. Move the cursor to the left until the text as rotated and pick to position it, as shown in step 4, Figure 6.28.

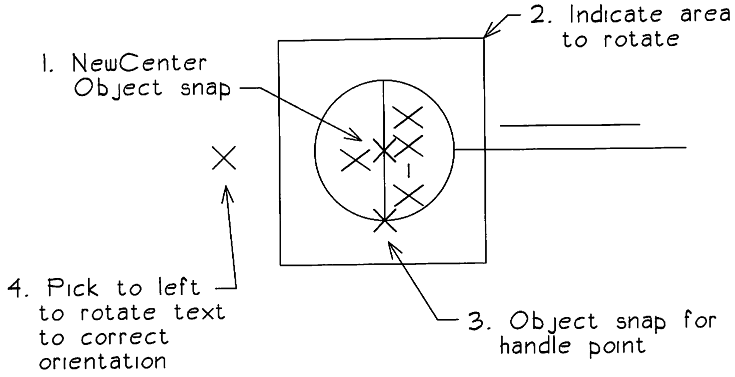

1. NewCenter Object snap
2. Indicate area to rotate
3. Object snap for handle point
4. Pick to left to rotate text to correct orientation

Figure 6.28: Steps for rotating the last symbol.

Use Quick Key!

T

Adding more symbols to your template

1. Press **T** to go to the Template menu.
2. Pick **SaveSymb**.
3. As always, check your path (sym\foundatn).
4. Type in **ftg-rt** and press Enter. (You could use the arrow key to move the text cursor to the right and type over "up" to change the text.)
5. Using Area, box around the symbol with the bubble on the right, as in Figure 6.29. The items will become grey and dashed.
6. Object snap to the end of the short line, as shown in Figure 6.29. This will be your reference point for the symbol. The symbol will go into the second box in the template.

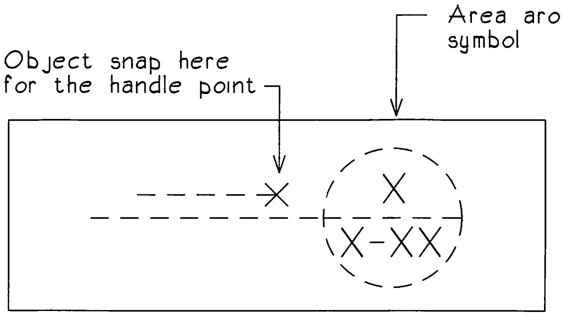


Figure 6.29: Steps for defining a symbol.

7. Type in **Footing Symbol Right** for the item name, and press Enter.
8. Press mouse 3 to quit back to the SaveSymb menu.
9. Type in **ftg-dn** and press Enter.
10. Using Area, box around the symbol pointing down, as in Figure 6.30. The items will become grey and dashed.
11. Object snap to the end of the short line, as shown in Figure 6.30. This will be your reference point for this symbol. The symbol will go into the template box.

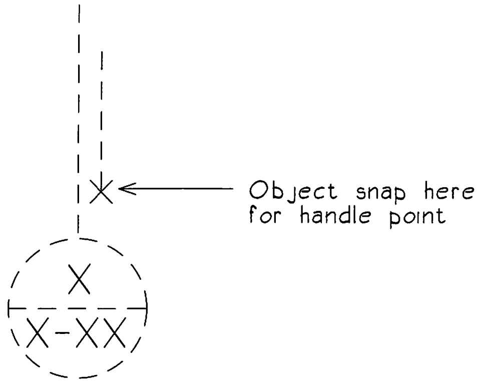


Figure 6.30: Steps for defining the next symbol.

12. Type in **Footing Symbol Down** for the item name, and press Enter.
13. Press mouse 3 to quit back to the SaveSymb menu.
14. Type in **ftg-lt** and press Enter (ftg-LT).
15. Using Area, box around the symbol pointing left, as in Figure 6.31. The items will become grey and dashed.
16. Object snap to the end of the short line, as shown in Figure 6.31. This will be your reference point for the symbol. The symbol will go into the template box.

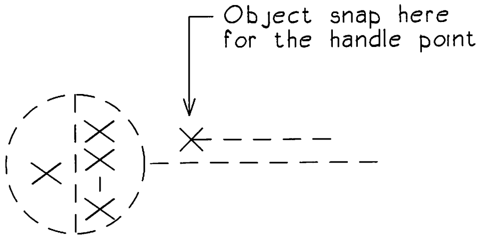


Figure 6.31: Steps for defining a symbol.

17. Type in **Footing Symbol Left** for the item name, and press Enter.
18. Press mouse 3 twice to exit and return to the Template menu.
19. All of the footing detail call-out symbols should be in the templates boxes and ready for you to use, as in Figure 6.32.

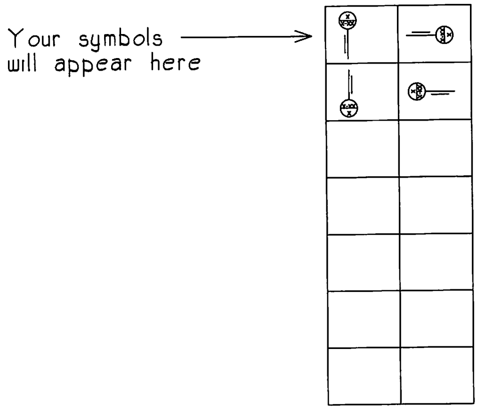


Figure 6.32: The symbols are in the Template and ready for use.

Adding the symbols to your drawing

1. Make sure you are still on the **Foundatn** layer. If you are not, press **(Tab)** until the layer is active.
2. Keep the **Explode** option on so that you will be able to edit the text in the symbols after you add them.
3. Turn OFF **DynmRot**. When you turn this option off, it prompts you to type in a new angle. The current angle should be 0. If it isn't, type in **0**. Press Enter. If it is already 0, just press mouse button 3.
4. Add the footing symbols to your drawing as in Figure 6.33. (The size of the symbols in the figure has been enlarged for illustration purposes.)

   Remember to use the **Window-in** features of DataCAD to help you see the foundation lines better. When you place your symbols, the cursor should highlight the outside wall. Then you know you have positioned the symbol correctly.

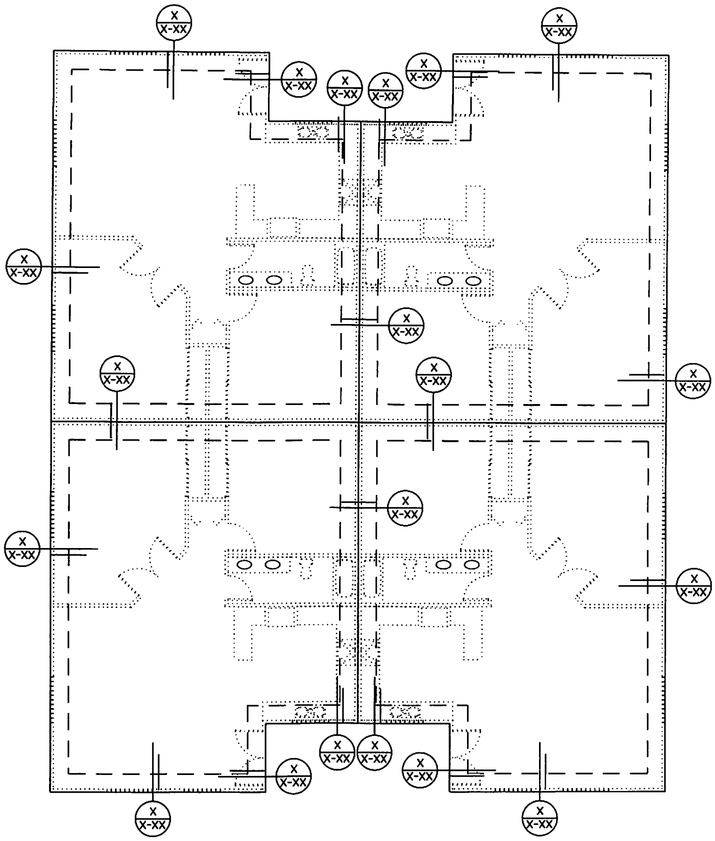


Figure 6.33: Add the footing symbols to your drawing.

Changing the text string in the symbols

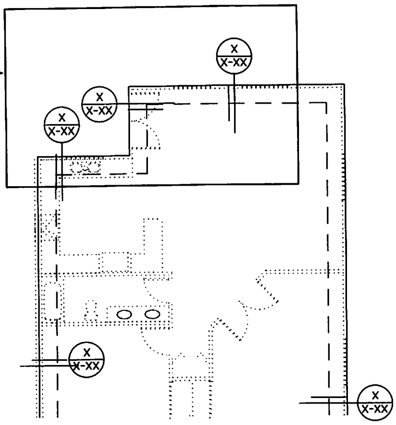
As mentioned earlier, you will be able to edit the text in the footing symbol if you exploded them.

1. Pick the **W button** in the control panel, to go to the Window In menu.
2. Pick two diagonal points to zoom into an area to see a few of the footing symbols easily, as in Figure 6.34.
3. Press **(Alt) C** to go to the Change menu.
4. Pick the **Text** option at the bottom of the menu.
5. Pick **Contents**.
6. Make sure **Area** is active.
7. Indicate a box around two or three symbols you can see easily, as in Figure 6-34.

Use Quick Key!

Alt

C



Indicate a box around two or three of the symbols to change

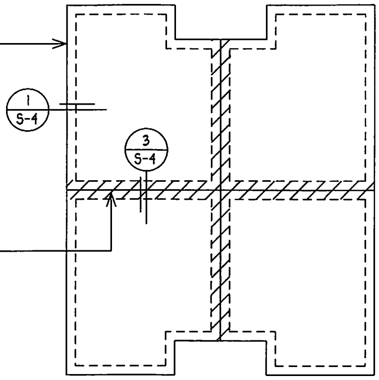
Figure 6.34: Edit the text in two or three symbols at a time.

8. The text will appear at the bottom of your screen in the message area for you to edit, one line at a time. When it appears in the message area, it disappears from the drawing area, so that you know which line you are editing.

9. When the **X** appears for a *single exterior wall*, type in **1** and press Enter. "1" would relate to the first detail in the detail sheet. See Figure 6.35.

10. When the **X** appears for one of the *interior party walls*, type in **3** and press Enter. "3" would relate to the third detail in the detail sheet. See Figure 6.35.

11. When the **X-XX** appears, type in **S-2** and press Enter. As an example, this would indicate the footing details existed on the structural detail sheet numbered S-2.



These walls are exterior footings shown on the detail sheet as detail #1

These walls (shown dashed) are interior party wall footings and appear on the detail sheet as detail #3

Figure 6.35: Detail numbers are different for exterior and party walls.

Use Quick Key!

Shift

F

12. As you continue editing your text, note the text that displays in the text edit line and which text is missing in your drawing. Then type in the appropriate detail sheet or number for the bubble and press Enter. The new text will appear in the footing symbol.

13. Press **(Shift) F** to File save your drawing.

Chapter Summary

During this chapter you learned the following:

How to copy items to other layers.

Changing linetypes and spacing.

Exploding symbols that are already on your drawing, by using the SymExp macro.

Mirroring and copying items simultaneously.

How to adjust the object snapping to grab onto the quadrant (four) points of a circle.

Creating a new template and a pathname for the new template.

Adding symbols to the template.

Rotating items both by defining an angle and by rotating them dynamically.

Changing existing text in your drawing.

CHAPTER 7

Plotting Your Drawing

Once you have completed your drawing, you will want to see it on paper, vellum, or mylar. The "CAD" term for this is "plotting".

Even though there are many types and makes of plotters or printers, the primary steps are basically the same.

Before you create the plot of your condo, the proper layers must be turned on. In the case of the foundation plan, your border should be turned on and the plan must be repositioned so that it is properly centered on the sheet.

Turning on the layers for the foundation plot

If you have just completed Chapter 6, the foundation layers are already turned on.

1. Press **L** to go to the Layers menu.
2. Pick **On/Off**.
3. Pick the **Border** layer name to turn it on.
4. If the foundation layers are not turned on, pick the layers called **DottedFl**, **Foundatn** and **FoundHch** until they are on.
5. Only these 4 layers should be on. Turn OFF all other layers.
6. Press mouse button 3 to exit.

Centering the foundation plan

Since there is **no UNDO** in the Move, Drag menu, which you will be using next, you will file your drawing before you use this command. Then, if you make a mistake that might take too long to correct, you can simply call back the saved version of your drawing.

Use Quick Key!

Shift

F

1. Press **(Shift) F** to File save your drawing.

2. Press **M** to go to the Move menu.

3. Pick **Drag**.

4. Make sure **Area** is active. If it isn't, pick it to make it active.

Use Quick Key!

M

5. Make sure **LyrSrch** is active also.

5. If necessary, pick the **E button** in the control panel to get the Extents (full view) of your drawing.

7. Indicate a box around the entire four-plex, as shown in Figure 7.1. All of foundation plan should become grey and dashed, showing that it has been picked. The border should NOT be grey and dashed, since you do not want to move the location of the border.

Note: *The border should never be moved, as it is used for all of your plans and for the plot layout. When you are using Move to relocate and center any drawing in the border, make sure ALL affected layers are turned on. Otherwise, the layers turned off will not be moved and will not align to the other layers.*

---

8. Once the plan is grey and dashed, you will be prompted to pick a "point to drag from". This will be the handle point by which you will pick up the area and move with your cursor.

   Pick somewhere in the center of your drawing, as indicated in Figure 7.1.

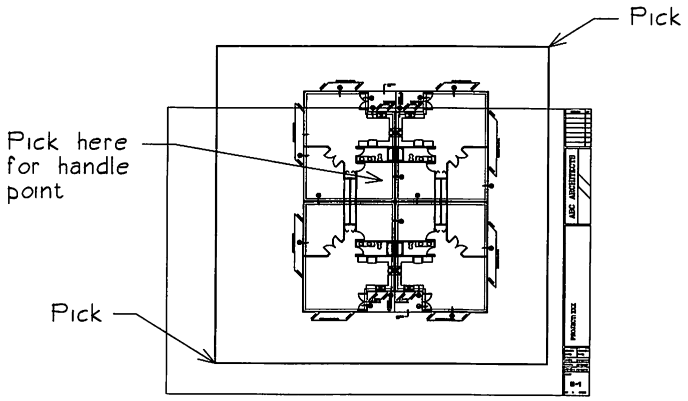


Figure 7.1: Indicating the area and the drag handle point.

Use Quick Key!

O

9. Move your cursor. You will be dragging a box which indicates the maximum size of the moving area.

10. If Orthomode is ON, you may want to press **O** to turn it OFF.

11. Once the "box" you are dragging looks in the correct position (centered in the border), pick to place it. It should look similar to Figure 7.2.

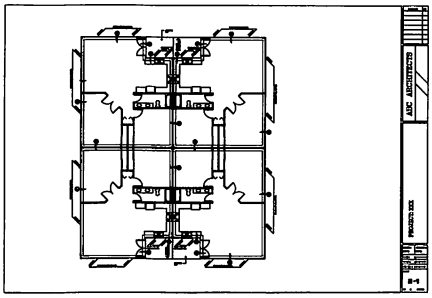

The drawing is centered

Figure 7.2: Centering the foundation plan.

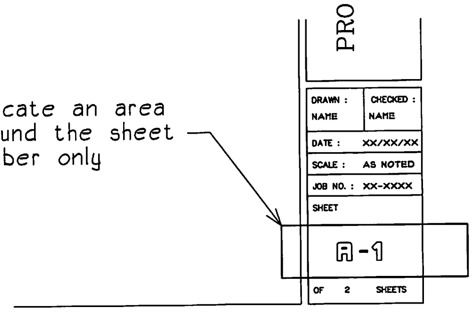
Moving the title to the Foundatn layer

In order to have the sheet number display the correct number for the foundation layout (and the correct number for the electrical layout, etc.), you will move the sheet number to the foundation layer. Later, you will copy it to the Electrc layer for the electrical layout and to the Notes layer for the floor plan.

1. Press **M** to go to the beginning of the Move menus.
2. Pick the **ToLayer** option.
3. Pick the layer you wish to move the title to. In this case, the layer is **Foundatn**.
4. With **Area** and **LyrSrch** still active, indicate an area around the sheet number, as shown in Figure 7.3. The number of entities moved will be displayed in the message area of your screen.

Use Quick Key!

M



Indicate an area around the sheet number only

Figure 7.3: Box around the sheet number.

Changing the sheet number

Now you will want to change the number to reflect a structural sheet.

1. Pick the **W button**, found in the control panel.
2. Pick two diagonal points to window-in to the sheet number area of the border, as shown in Figure 7.4.

Use Quick Key!

Alt

C

3. Press **(Alt) C** to go to the Change menu.
4. Pick the **Text** option.
5. Pick **Contents.**
6. Using **Area**, box around the sheet number again.
7. When the **A-1** comes up in the text edit line, type in: **S-1** and press (Enter).

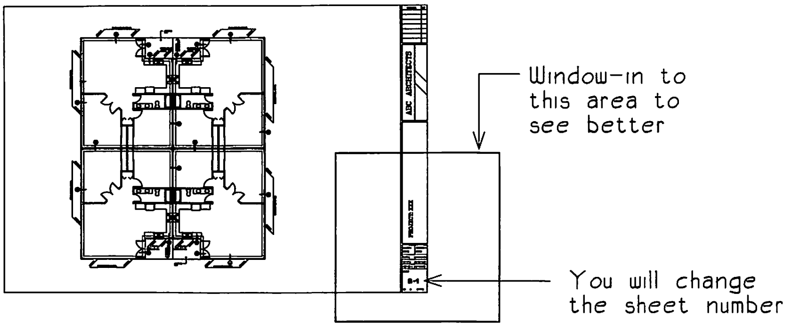

Window-in to this area to see better
You will change the sheet number

Figure 7.4: Changing the sheet number.

Use Quick Key!

P

Adding the sheet title

1. Press **P** to go to the **P**revious view window, which was the full view of your drawing.
2. Pick the **W button**, found in the control panel.
3. Pick two diagonal points to window-in to the title area of the drawing, as shown in Figure 7.5.

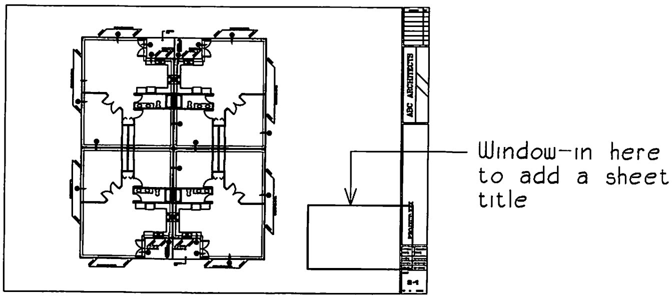


Figure 7.5: Windowing into the title area.

Use Quick Key!

Alt

T

Use Quick Key!

K

4. Press **(Alt) T** to go to the Text menu.
5. Press **(Tab)** until the **Foundatn** layer is active.
6. Make sure that the cursor is **Yellow**. If yellow is not the active color, press the **K** key until it is.
7. Pick **Size**.
8. Type in **2** and press (Enter). Your text will be set to 2'-0" high, which will be 1/2" text when plotted at 1/4" scale.
9. Pick **FontName**. This option allows you to pick the different type faces available in DataCAD.

10. Pick the font name **HLV_BP**. The name stands for Helvetica, Bold Proportional type.
11. Check that the "Justification" option is set to **Left**. If it isn't, pick **Left** until it is active.
12. Press **(Caps Lock)** to type in capital letters.
13. Pick in the title area to start your title text, as shown in Figure 7.6.
14. Type in **FOUNDATION PLAN** and press (Enter).
15. Press mouse button 3 to quit the paragraph.
16. Press mouse button 3 to exit the Text menu.

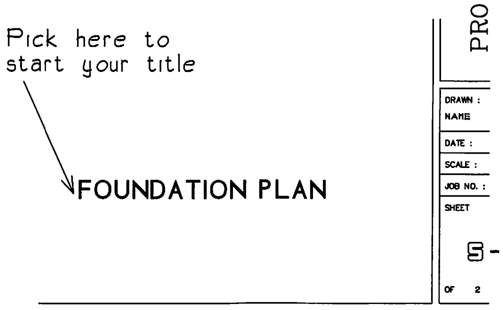


Figure 7.6: Steps for adding the sheet title.

Drawing the sheet title underline

You can create a thick line under the sheet title by using the line weight function.

1. Press the **(Caps Lock)** to turn it off.
2. Press the **W** key to change the line weight to 2. This will create a line that is stroked once (weight 1), then one more time on each side of the line, for a total of 3 strokes.

Use Quick Key! W

3. Press **W** two more times, until the message says the line weight is set to **4**. (If you go too far, press (Shift) W to go backwards.) This will create a nice, heavy line, with the total strokes of 7 (one on both sides of the line for every weight number).
4. Now, pick to start the beginning of your line, as shown in Figure 7.7. Wiggle your cursor. Notice that Orthomode is probably OFF. You should always use Orthomode, since a "eyeballed" straight line will look crooked in the final plot.

Use Quick Key! O

5. Press **O** to turn Orthomode ON.

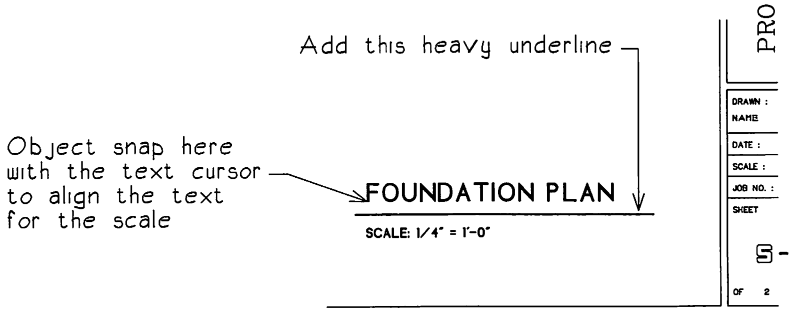


Figure 7.7: Steps for adding the underline and scale information.

Use Quick Key! Shift W

6. Pick to finish the underline, as shown in Figure 7.7. The line will look thick and bright on the screen.
7. Press **(Shift) W** 3 or 4 times until the line weight is back to **1**.

Creating the scale note

Use Quick Key! Alt T

1. Press **(Alt) T** to go to the Text menu.
2. Pick **Size**.
3. Pick **6**" off the list off the options and press mouse button 2 to Enter. Or, type in **.6** and press (Enter). This will change the text back to 1/8" when plotted at 1/4" scale.

Note: *If you are typing in a value, such as a text size, the middle mouse button 2 can be used as an (Enter) key!*

---

4. Hold the cursor at the lower left-most spot of the **F** in the word FOUNDATION, and Object snap. The text cursor will attach to the F, as shown in Figure 7.7.
5. Press (Enter) about 4 times. The text cursor will jump down to an appropriate place to start the word SCALE.
6. Type in **SCALE: 1/4" = 1'-0"** and press (Enter). (You might want to use (Caps Lock) again. Remember to turn it OFF when you are done with this step.
7. Press mouse button 3 to quit the paragraph.

Updating the title block information

The title block contains text that is to edit. It appears as green text in the title bock.

Use Quick Key! P

1. Press **P** to go to the Previous view window.
2. Pick the **W button** in the control panel to go to the WindowIn menu.
3. Window in to the title block area of the border, as shown in Figure 7.8.

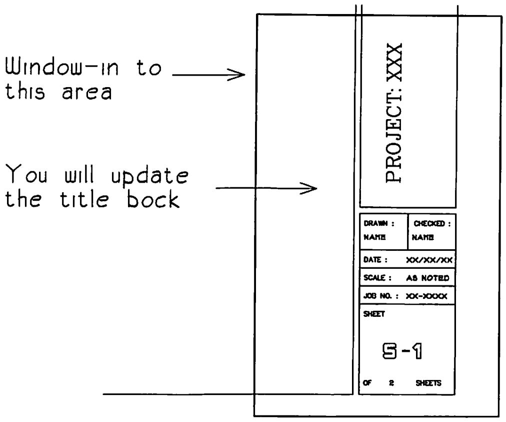


Figure 7.8: Window-in to this area of the border.

Use Quick Key!

Alt

C

4. Press **(Alt) C** to go to the Change menu.
5. Pick the **Text** option.
6. Pick **Contents**.
7. Make sure **Area** and **LyrSrch** are still active.
8. Box around the entire title block area that contains the green text you wish to edit, as shown in Figure 7.9.

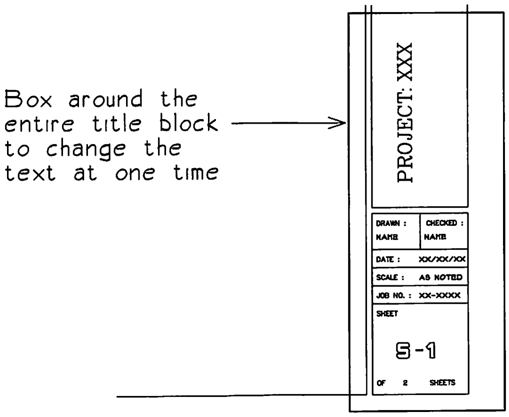


Figure 7.9: Box around the entire area to change the text, as shown.

9. The first words that will appear in the editing line will be the yellow block titles. You do not want to change these. You can also see them disappear on the screen as they come up in the editing line. Press Enter each time until the first green text appears.

   In other words, when **DATE:**, **SCALE:**, **JOB NO.:**, **SHEET**, **OF**, **SHEETS**, **DRAWN:**, and **CHECKED:** appears, press Enter.
10. When the first green text appears, you will change it. So, when **NAME** appears from the DRAWN area, type in your last name (ex. SMITH) and press Enter.
11. When **XX/XX/XX** appears, change it to the present date, following the same format (ex. 09/23/94), and press Enter.
12. When **AS NOTED** appears, press Enter, because you will not change this for now, since you did note the scale.

13. When **XX-XXXX** appears, indicating a job number, type in **94-0149** and press Enter. Or, you could type in a job number more appropriate to your company's standard.
14. When **1** appears from the OF SHEETS area, type in **4** and press Enter.
15. When **NAME** appears from the CHECKED area, you could type in **SMITH** or your checker's name and press Enter, or don't type anything and press Enter to leave it unchanged.
16. When **PROJECT: XXX** appears, move your text editing cursor over to the first X in the line by pressing the arrow key pointing to the right. Then type in **HILLCREST CONDOMINIUMS** and press Enter.
17. When **S-1** appears, press Enter.
18. You may also want to change the company name to your company's name.
19. When you are done changing text, press mouse button 3 to exit the menu.
20. If you have been using **(Caps Lock)**, press it to turn it OFF.
21. Press **(Shift) F** to File save your drawing.

Use Quick Key!

Shift

F

Adjusting the paper and scale for plotting

Now your drawing is ready to plot or print. The following steps will help you get set for either.

Use Quick Key!

Alt

P

1. Pick the **E button** in the control panel to get the full Extents of your drawing.
2. Press **(Alt) P** to go to the Plotter menu.
3. Pick the **PaperSiz** option.
4. Notice the paper size is pre-set to a **Custom 23" x 34"**, as displayed at the bottom in the message area. This would be the best, maximum size for a 24x36 D size sheet.
5. IF you are using a plotter or printer with a smaller sheet size, you would have to pick the option from the list, or type in your own custom size.

   For example, if you were going to use a printer with a 8 1/2" x 11" paper, pick **8.5x11A** from the list.
6. Once you are happy with your paper size setting, press mouse button 3 to exit this menu.
7. Pick **Layout**. This option allows you to look at how the paper fits with your drawing and to change the position of the paper if necessary.
8. Notice the present location of the paper is displayed as a dashed rectangle. The rectangle is divided with two bisecting lines to help you see the middle of the paper.
9. If you changed the paper size in step 5, you will see that the paper is much smaller than the drawing. This is because the present scale is set to 1/4". To plot this drawing on a small paper, you will want to change the scale.
10. Move your cursor out to the drawing area. A yellow rectangle will appear, attached to your cursor. (Your cursor is in

the exact middle of the rectangle - but you can't see it.) If you needed to move the position of the paper, you would pick to place it. However, you will NOT want to do this now.

11. Press mouse button 3 to exit the Layout menu. Notice the rectangle is still displayed.
12. Pick the **Scale** option.
13. The message: *Current plotting scale is: 1/4"* is displayed. To see how your drawing fits on the paper in another scale, pick the **3/16"** option.

Note: *If you are plotting your drawing at a scale other than 1/4", the text will not plot at 1/8" size.*

---

14. When Layout is on and you change the scale, you are automatically put back into the Layout menu and given the opportunity to shift the layout position. Press mouse button 3 to exit back to the Plotter menu.
15. If you changed your paper size to 8.5 x 11", you can change your scale to fit! Pick **Scale** again.
16. Pick the 1/16" option.
17. The layout is displayed and the drawing should now fit inside the paper. Press mouse button 3 to exit the Layout menu.

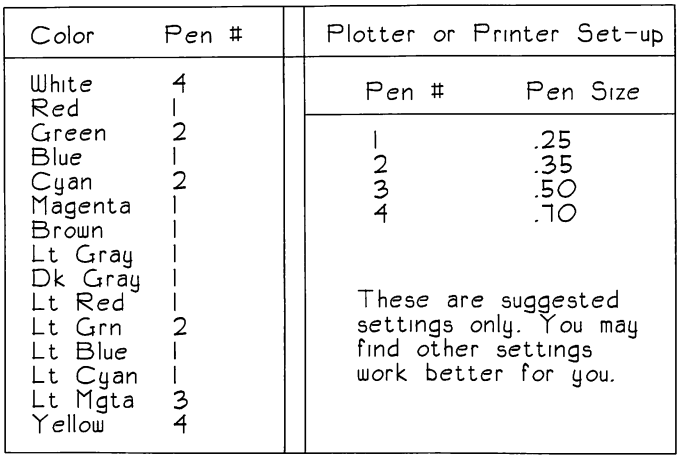
Setting your pens

The SetPens option allows you to set the pen number that will be used with the colored items in your drawing. For example, red lines might plot with pen number 1, while yellow lines might plot with pen number 4. On your plotter, pen 1 might be a .25 pen, while pen 4 is a .70 pen. On a printer such as the laser-jet, pen 1 would be thin while pen 4 would be heavier.

You could even have colored pens in your plotter or relate the pen numbers to a colored ribbon pen table in your matrix printer.

1. Pick the **SetPens** option. If you do not see this option, you would want to make sure PlotPens (make Plotter Pen changes) is active, and that SnglPen (Plot with a Single Pen) is NOT active.
2. Pick **White**.
3. The number should be set to **4**. White items, which include the walls in your floor plan, should be thick. Press Enter without changing the value.
4. Pick **Red**. This color includes the dotted floor plan in your foundation layout. You want a very thin pen for this color. The number is set to **1**. Press Enter without changing it.
5. The current pen settings are displayed in Figure 7.10.

Note: The printer set-up will depend on your own printer and whether you can map pen thicknesses. Pen numbers are not currently supported by DCPRINT. Another way to get thick and thin lines is to use Line Weights in your drawing!



Color	Pen #
White	4
Red	1
Green	2
Blue	1
Cyan	2
Magenta	1
Brown	1
Lt Gray	1
Dk Gray	1
Lt Red	1
Lt Grn	2
Lt Blue	1
Lt Cyan	1
Lt Mgta	3
Yellow	4

Plotter or Printer Set-up

Pen #	Pen Size
1	.25
2	.35
3	.50
4	.70

These are suggested settings only. You may find other settings work better for you.

Figure 7.10: The current pen settings shown in a table.

6. Press mouse button 3 to exit the SetPens menu.
7. If you are going to plot a 8.5 x 11" paper at 1/16" scale, you drawing will be quite small. Because of the tiny size, pen weights will be too dark and can cause smearing on some printers that use wet ink.

   If you are plotting at this small scale, pick **PlotPens** to turn it OFF! Now all lines will be plotted with pen number 1. (The pen settings are saved if you wish to use a larger plot later.)

Selecting the plotter

DataCAD allows you to configure up to 3 plotters. You should check which plotter you are using.

1. Pick **Select**.
2. Look at the message area. The middle line that contains the **Plotter** = remark will display the presently set plotter, such as Plotter = Hewlett Packard HP-GL. (Large D.
3. The first line in the message area will display the type of plotter configured for the option your cursor is on.

   As an example, move your cursor to the first option, **Plotter1**. The plotter configured will appear on the first message line. Move your cursor to highlight the second option, **Plotter2**. The plotter name configured for plotter2 will appear on the first message line, if there one configured. The same is true for **Plotter3**.
4. Once you know which plotter you will be using, select it to make it active. (Ex. If you are going to a HP III LaserJet, you should have displayed: **Plotter = Hewlett Packard HP-GL. (LaserJet III version.**)

***Note:** If you will be using the DCPRINT utility to run your printer, set the plotter selection to **Plotter = CADKEY Uniplot Format**. This must be configured first in the DataCAD Configure program.*

---

5. Press mouse button 3 to exit the Select menu.

Sending the drawing to a plotter

Once you have made necessary adjustments to the plotter settings, you are ready to send the drawing to the plotter.

For plotters: You can follow these steps if you have a plotter attached, turned on and ready with paper and pens.

For printers: You can also follow these steps if you have a laser type of printer that has HPGL language processing, such as the HP LaserJet III or IV. Or, you might have a cartridge for HPGL processing that enables your printer to print HPGL.

1. Once you have your plotter/printer ready, pick the **Plot** option.
2. To abort the plot early, you can press the **(End)** key.

Sending the drawing to a file for printing or for sending to a plotting service

If your printer does not have HPGL, you can send the plot to a file and process it with the DCPRINT program included with DataCAD. You will also want to print to a file if you are using a plotting service.

Sending a plot file to a service is desirable over sending your actual drawing, because you will be assured that your settings are correct and that the correct type faces are used. (Otherwise, the services must have all of your type faces, or fonts.) And, they will not have your original drawing, either.

Plot files all have the extention of **PLT,** so when you make a file, it can have the same name as your drawing, or you can give it a new name, such as the plan type.

1. Once all of the settings in the Plotter menu are correct, pick the **ToFile** option.
2. Pick **NewPath**.
3. Type in: **plots** and press Enter. this will be the directory that will hold your plot files.
4. If this is a new directory, you will be prompted to create it. Pick **Yes**.

5. The existing name of your drawing file will appear in the message area. You are prompted to Enter Destination file:, which will become the name of the plot file.

   Type in the name for your file: **foundtn1** and press Enter. This is a DOS file, so you have an 8 character limitation.

6. The file will be created. You will find the file in the **DCAD\PLOTS** directory. The filename will be FOUNDTN1.PLT.

Using DOS to transfer or print files

If you are using a printing service, you will want to copy the plot file to a diskette to take to the service. If you have a modem, you may use it. You might also want to go to DOS to print the file using DCPRINT.

1. Press mouse button 3 until you are in the Utility menu.
2. Pick the **File I/O** option.
3. Pick **DOSShell**. You will exit to the DOS prompt.
4. To run DCPRINT:

   At the DOS prompt, type in: **dcprint** and press Enter.

   To change the plot file path, pick the **Setup** option, by moving the cursor with the up and down arrow keys and pressing Enter when the option is highlighted.

   Pick **Set Paths**.

   Pick **Get Plot File Path** from DataCAD. The path should be set to PLOTS\.

   If the path is not correct, pick **Plot Files**. Type in: **PLOTS** and press Enter. (It may not be set correctly if PLOTS was a brand-new pathname, since it was not in the configuration file yet. The configuration file is not saved until you quit DataCAD.)

   Follow the directions in the User Reference manual to correctly implement your printer and plot.

   Press **(Esc)** to exit Setup.

   Press Enter to **Save Changes in Setup**.

   Press **(Esc)** to exit DCPRINT. You will return to the DOS prompt.

5. To copy to diskette:

   At the DOS prompt, type in: **cd\mtec\plots** and press Enter.

   Put a diskette in the A or B drive.

   Type in: **copy foundtn1.plt a:** and press Enter, or type in: **copy foundtn1.plt b:** and press Enter. The file should copy. If not, check your spelling and your DOS command structure.

6. To return to DataCAD from the DOS shell:

   At the DOS prompt, type in: **exit** and press Enter.

Saving which layers are on and off

Once you have carefully turned on and off layers for proper plotting, you can "save" your settings. It then becomes an easy task to reset the layers on and off again!

1. Pick the **E button** in the control panel to make sure you have the full extents of your drawing.
2. Make sure your **(Caps Lock)** is OFF.
3. Press **V** to go to the GoToView menu.

Use Quick Key!

V

Note: *GoToViews can only be saved to a "fixed view scale" (ie., 1/16", 1/4"), in contrast to a "free-zoom extents scale" (ie, a scale to fit to your screen, such as .006344). To adjust to a fixed scale, press (Page Up) or (Page Down).*

---

4. Press **(Page Up)** once to go to the next fixed view scale. The view scale will be displayed in the status area of your screen, below the active layer name.
5. Pick the **SaveView** option.
6. Pick **View3**.
7. You will be prompted to give the view a name. Type in **FoundPln** and press Enter. The view will be saved.
8. You will notice that there is an option called **FloorPln**. This is a view that was previously saved in the Default sheet. Pick **FloorPln**. The layers will be displayed.
9. If your monitor is a different size or has a different resolution than the computer's monitor the view was originally saved on, the view may not fit your window. To adjust for your monitor, pick the **E button** in the control panel to get the full Extents of the drawing.
10. Press **(Page Up)** once to adjust to a fixed view scale.
11. Pick **SaveView**.
12. Pick **FloorPln**.
13. Press Enter to save it under the same name. The full view of your drawing will now be saved, along with the layer settings.
14. Pick **FoundPln**. Did the foundation plan come up?
15. Pick **FloorPln**. Did the floor plan display?

Adding the sheet title and number to the other plans

You can copy the sheet title and number to other layers that will be used in the other plan sheets, such as the electrical and the floor plan. Then, your titles will have consistancy and look nice, as well as saving you steps in recreating them.

1. Leave the **FloorPln** view on.

Use Quick Key! L

2. Press **L** to go to the Layers menu.
3. Pick **On/Off**.
4. Pick **Foundatn** to turn it on temporarily, in order to display the sheet title and number. (Example: FOUNDATION PLAN, SCALE: 1/4" = 1'-0", the underline and S-1.)
5. Press mouse button 3 to exit.

Use Quick Key! C

6. Press **C** to go to the Copy menu.
7. Pick the **ToLayer** option.
8. Pick **Electrc** to copy the sheet number to the Electrc layer. (The layer does not have to be displayed to copy to it.)
9. Pick **Entity** to make it active.
10. Pick the sheet number **S-1**. Look for the message: *1 entity selected.*
11. Pick **Area** to make it active.
12. Indicate a box around the sheet title, which includes the words FOUNDATION PLAN, SCALE: 1/4" = 1'-0", and the underline, as shown in Figure 7.11. They will be copied to the layer also.

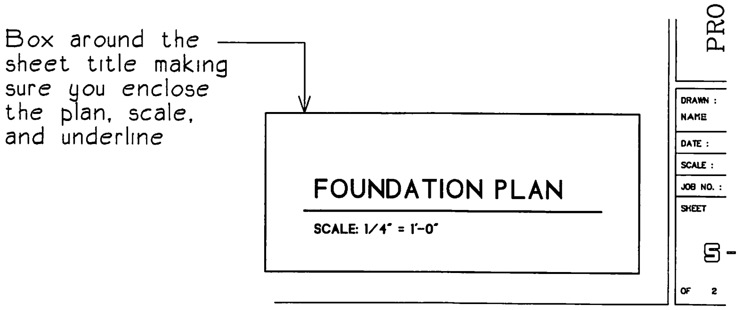

Box around the sheet title making sure you enclose the plan, scale, and underline
FOUNDATION PLAN
SCALE: 1/4" = 1'-0"
PRO
DRAWN :
NAME
DATE :
SCALE :
JOB NO. :
SHEET
S-
OF 2

Figure 7.11: Box around the title.

13. Pick **NewLyr**.
14. This time, pick **Notes**.
15. Pick **Entity**.
16. Pick the sheet number **S-1** again. Look for the message: *1 entity selected.*
17. Pick **Area** to make it active.
18. Indicate a box around the sheet title again, as shown in Figure 7.11. They will be copied to the layer also.

Changing the sheet information

Now that you have copied the title and number to the different layers, you will want to perform a text change. The first one you will change is for the floor plan.

Use Quick Key! L

1. Press **L** to go to the Layers menu.
2. Pick **On/Off**.
3. Pick **Foundatn** to turn it off.

4. Press mouse button 3 to exit.

Use Quick Key! Alt C

5. Press **(Alt) C** to go to the Change menu.
6. Pick **Text**.
7. Pick **Contents**.
8. Pick **Entity**.
9. Pick the **S-1** text that is now on the Notes layer. (You may want to press the (Esc) key to refresh the screen in order to see the text.)
10. Type in **A-1** to change the sheet number to the foor plan, and press Enter.
11. Pick the FOUNDATION PLAN text.
12. Type in **FLOOR PLAN** and press Enter.

Saving the electrical plan view

Now you can follow the same steps to update the electrical sheet text and save the view.

Use Quick Key! L

1. Press **L** to go to the Layers menu.
2. Pick **On/Off**.
3. Pick **Dims** and **Notes** to turn them OFF.
4. Pick **Electrc** to turn it ON.
5. Press mouse button 3 to exit.

Use Quick Key! Alt C

6. Notice the sheet number is still S-1. Press **(Alt) C** to go to the Change menu.
7. Pick **Text**, then **Contents**.
8. Pick the **S-1** text.
9. Type in **E-3** and press Enter.
10. Pick the FOUNDATION PLAN text.
11. Type in **ELECTRICAL PLAN** and press Enter.

Use Quick Key! V

12. Now you are ready to save the view. Press **V** to go to the GoToView menu.
13. If you want to adjust your view scale, pick the **E button** to go to the full view Extents of your drawing. Then, press **(Page Up)** once in order to go to a fixed view scale.
14. Pick the **SaveView** option.
15. Pick **View4**.
16. Type in the new name: **ElectPln** and press Enter. The view is saved! Now you can quickly plot a foundation, floor and electrical plan using GoToViews.

Use Quick Key! Shift F

17. Press **(Shift) F** to File save your drawing.

Chapter Summary

During this chapter you learned the following:

How to Move, Drag to center your drawing in the border.

To move items from layer to layer using Move, To Layer.

Different fonts are available. You can set the font by using FontName in the Text menu.

The W key is the quick key to adjust the line weight (thickness). Pressing W makes the line thicker, pressing (Shift) W makes the line thinner.

You can plot on different size paper in various scales.

Many sizes of paper are pre-set and you can adjust more using Custom.

Pens are set in relation to colors in your drawing. On a pen plotter, the pen numbers directly correspond to the pen in the holder.

You may have more than 1 plotter configured, but you must make sure it is selected before sending the plot.

Number of plot copies can be set for printed plots.

You can print to a file. The file can be used to create a print of your drawing by using DCPRINT. You can also send it to a service bureau for a plot.

You can go to DOS by using the DOSShell option found in File I/O.

Items can be copied from one layer to another layer using Copy, ToLayer.

You can save how the layers are displayed (on and off) and the current view window, by using the GoToView menu. This is a great help for plotting the different plans.

How to change from a free zoom view scale to a fixed view scale by pressing (Page Up), in order to save a view.

Editing text is possible by using the Change, Text, Contents options.

CHAPTER 8

Presentation Drawings

During this chapter you will learn some easy techniques to turn your 2D drawing into a perspective line drawing and a shaded 3D presentation model. Later, you will want to explore the advanced modeling features of DataCAD in order to create a detailed, realistic model of your project.

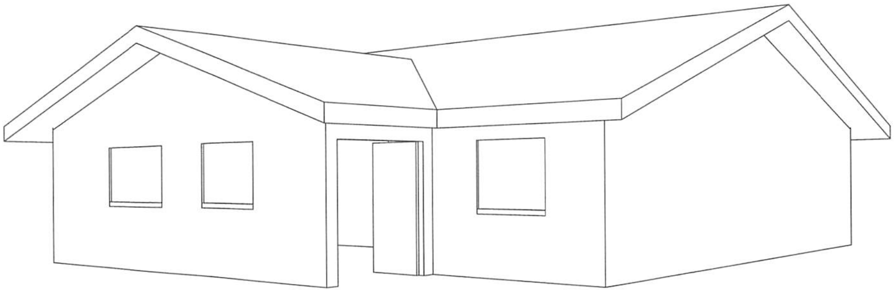


Figure 8.1: You will learn the steps to create 3D drawings.

Turning on and off the proper layers

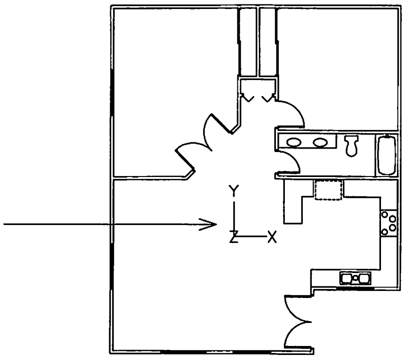
You will want only the layers on that will be used for the 3D view.

1. Press **L** to go to the Layers menu.
2. Pick **On/Off**.
3. Make sure **Walls**, **Doors**, **Wdws**, **Cabinet**, and **Plumb** are turned ON. If they aren't, pick the layers to turn them on for displaying.
4. Make sure **Border**, **Dims**, **Notes**, **Electrc**, **Hatch**, **DottedFl**, **Foundatn**, and **FoundHch** are turned OFF. If they aren't, pick the layers to turn them off.
5. Press mouse button 3 to exit.

Creating an isometric view

The first 3D view you make will be an isometric view of your drawing.

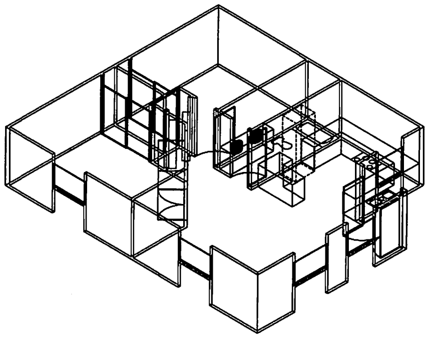
1. Pick the **V button** in the control panel, to go to the 3D Views menu.
2. Pick **Controls**. You can adjust the view center with this option.
3. Pick **Reset** to make sure you are in the correct orthographic position.
4. Pick **ViewCntr**.
5. Move the cursor to the middle of your floor plan and pick, as shown in Figure 8.2.



Pick in the center of the drawing

Figure 8.2: Pick to establish the view center.

6. Press mouse button 3 to exit back to the 3D Views menu.
7. Pick **Isometrc**. A 3D isometric of your condo will be displayed, as shown in Figure 8.3.



An isometric view of the condo

Figure 8.3: Your condo in an isometric view.

8. Pick the **E button** to get a full view Extents of your drawing.

Shading your drawing

Use Quick Key

J

Once you are in a 3D view, you can try the Quick Shader!

1. Press J to go to the 3D Edit menu. (Make sure (Caps Lock) is off.)

2. Pick **QShader**.
3. **LightL**, **BlackEdg**, and **All** should be the only items active. If they are not, pick them to make them active. If other options are active, pick them to turn them off.
4. Pick the **Begin** option.
5. Notice that all of the objects in your drawing have a black outline around them. You can turn this off by turning on NoEdge.
6. Pick **NoEdge** to make it active. BlackEdg will turn off.
7. Pick **Begin**.
8. Notice where the light source is. The brightest surfaces are facing the left side. This is because LightL (Light Left) is active.
9. Pick **LightR** to make it active. LightL will turn off.
10. Pick **Begin**. Do you like this effect better?

Viewing simple 3D objects

You may notice that the walls on top of the doors and the walls on the top and bottom of windows are gone. This is because you used simple wall polygons to create your walls. When you inserted a door, for example, the wall was cut open to look correct in a production drawing (plan view).

As you become more skilled with the use of DataCAD, you may learn how to use the advanced 3D Entities found in the Modeler. With 3D Entities, you can create wall "Slabs" with holes for your windows. These kinds of options are found in the DCAD 3D menus.

However, you can achieve a more finished look in your 2D drawing right now. You will add wall sections to the top and bottom areas where needed. This is done with the Walls function and by adjusting the Z-base and heights.

Creating the layer for the headers and sills

1. Pick the **Ortho button** in the control panel. This will take you back to the plan view.
2. Press the **(;)** key to go back to 2D DataCAD.
3. Press **L** to go to the Layers menu.
4. Pick **NewLayer**.
5. Press Enter to accept the number **1**. This will create 1 new layer.
6. Pick the **Name** option.
7. Pick the last layer on the list, which may be called **Layer14**. (You may need to pick NextPage to see it.) This will be the layer you just created.
8. Type in the new name for the layer: **HeadSill** and press Enter.

Use Quick Key

;

Use Quick Key

L

9. Press mouse button 3 to exit.
10. Press **(Tab)** or **(Shift) (Tab)** until the **HeadSill** layer is active.
11. You will want the layer color set to white.
12. Pick **White**. (Or, you could use the **K** key to change your colors.) The layer is ready.

Creating the walls under the sills

Use Quick Key A

The first objects you will create are the sills for under the windows.

1. Press **A** to go to the Architct menu.
2. Pick **Walls** until it is active.
3. Pick **Sides** to make it active also.
4. The other options should be turned off. If they aren't, pick them to make them inactive.
5. Pick the **Width** option.
6. Pick **4**" and press the middle mouse button to Enter.
7. Press the **Z** key to adjust the Z-base and height of the walls you will add under the sills.
8. Type in **0** for the Z-base and press Enter.
9. Type in **3.5** for the Z-height and press Enter. Now you can create a wall that is only 3'-5" high, which happens to be the height for the bottom of your window sill.

Use Quick Key Z

Note: *You may want to double check the sill height of your window. This is easily accomplished by using the* ***Indentify*** *menu. Pick the* ***I button*** *(Identify menu) in the control panel. Pick the outside sill line of your window. Look in the message area of the screen. What does the "Base =" (base of the window sill) say? What it reads will be the height you need for the walls under your window. If it was different then 3'-5", press* ***Z*** *and set the Z-height to the value you need, then press (Enter). Press* ***A*** *to go back to Architct menu if necessary.*

---

10. Pick the **W button** in the control panel.
11. Indicate two diagonal points to window-in to the two front windows so that you can see them closely. This is shown in Figure 8.4.

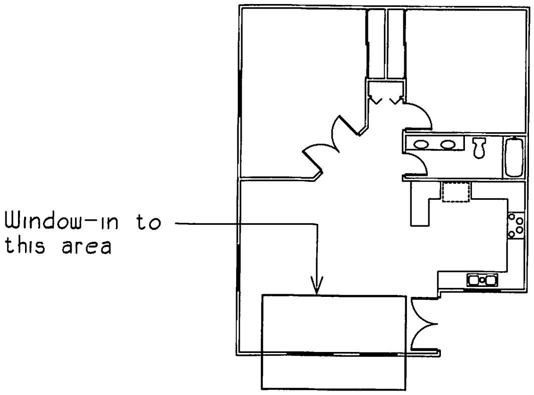


Figure 8.4: Window-in to the two front windows.

12. Press mouse button 3 to exit the Window-in menu.
13. Object snap to the front left side of the left-most window, as shown as step 1 in Figure 8.5.
14. Object snap to the other side, shown as step 2 in Figure 8.5.
15. Pick to the inside to define the other side of the wall, as shown as step 3 in Figure 8.5.

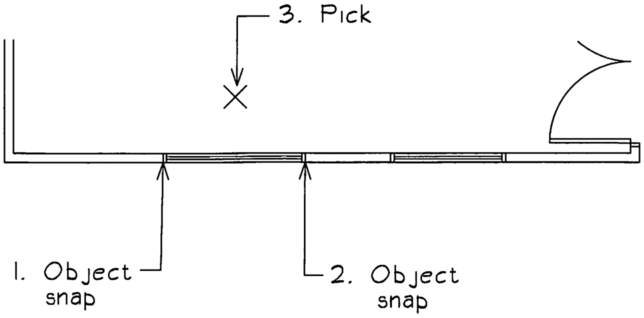


Figure 8.5: Steps for drawing the wall under the sill.

16. Press mouse button 3 to quit the line.
17. Repeat these step to the second window, as shown in Figure 8.6.

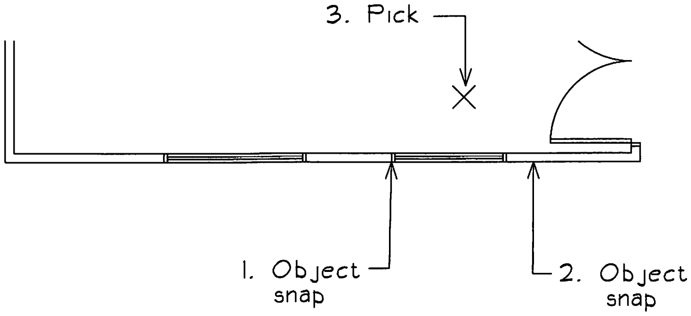


Figure 8.6: Steps for drawing the wall under the second sill.

18. Continue adding the sills to the other windows, except the kitchen one. You created it at a different sill height.

19. When you are ready to add the wall under the sill for the kitchen window, pick the **I button** in the control panel. This will take you into the Identify menu. As described earlier, you can identify what the base of your window sill is.

20. Pick the outside line of the window sill, as shown in Figure 8.7. The line will become grey and dashed.

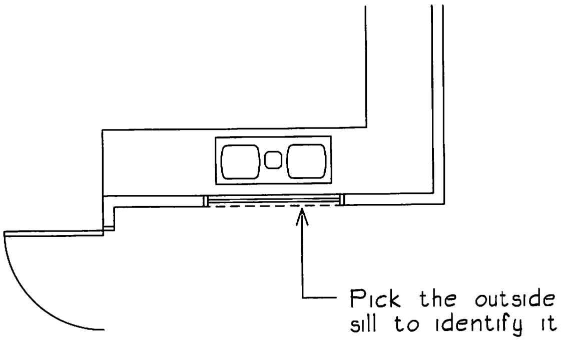


Figure 8.7: Identify the sill height.

21. Notice the **Base =** readout in the message area. It should read **3'-1"**. When you created this window, you set the sill height to 3'-4". The actual sill is created 3" below the height. 3'-1" will be the new Z-height. If the base is different, use this value for the Z-height in the next steps.

Use Quick Key

Z

22. Press mouse button 3 to exit Identify.

23. Press the **Z** key.

24. Press Enter to accept the **0** for the Z-base.

25. Type in **3.1** and press Enter for the Z-height.

26. Draw the wall under the kitchen window.

Creating the header walls

Use Quick Key

Z

Now you can create the walls for the headers of both the doors and windows.

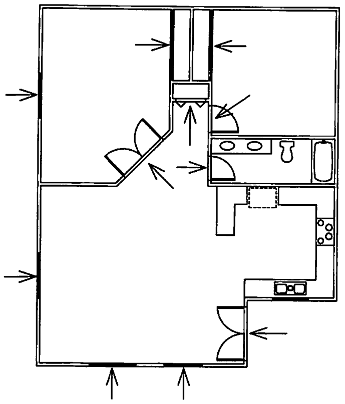
Use Quick Key

Page Down

Use Quick Key

→

1. Press the **Z** key.
2. Type in **6.8** for the Z-base and press Enter.
3. Type in **8** for the Z-height and press Enter. Now you can create a wall that starts 6'-8" in the air and goes to 8'-0".
4. Repeat the steps to object snap to both sides of each window and door opening, creating a header for each, as shown in Figure 8.8. You may want to use the **(Page Down)**, **(Page Up)**, or **(Arrow)** keys to adjust your view window to see better.



Add headers to all openings indicated by arrows

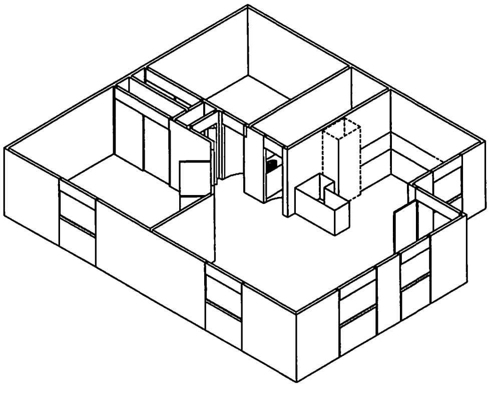
Figure 8.8: Create headers for all openings.

Trying the Q-Shader again

Now that the walls are filled in, the shaded 3D view will look much better!

Use Quick Key **J**

1. Press **J** to go to the 3D Edit menu.
2. Pick **QShader**.
3. Pick the **Para button** in the control panel. This will take you back to the last parallel view you had defined, which happens to be your isometric view.
4. Pick **Begin**. How does your drawing look now? (See Figure 8.9.)



The shaded isometric doesn't show the edge lines as this model does

Figure 8.9: You now have a shaded isometric with solid walls.

Using the ROOFIT macro

Now that your condo looks so nice, it would be great if it had a roof. To keep this process simple, you will model the roof as though it were a single condo, not one of a four-plex.

To create the roof, you will use a macro called "Roof-it". This macro creates modeled entities.

Creating the Roof Layer

Use Quick Key

L

You will create the roof on a new Roof layer.

1. Press **L** to go to the Layers menu.
2. Pick **NewLayer**.
3. Press Enter to accept **1**.
4. Pick **Name**.
5. Pick the last layer. You may have to use **NextPage** to see it.
6. Type in the new name: **Roof** and press Enter.
7. Press mouse button 3 to exit.
8. Press **(Tab)** until the **Roof** layer is active.
9. Pick **Color**.
10. Pick **Red**.

Setting up the ROOFIT macro

Use Quick Key

Shift

M

Many macros have setting options which, once the setting is made, will keep the information until you use it again. This is the way ROOFIT works. So, before using it, you must check to see what settings are current.

1. Press **(Shift) M** to go to the Macro menu.
2. Look for the macro called **ROOFIT**. You may have to use the **NextPage** option if you own many macros.
3. Pick **ROOFIT**.
4. The first roof you will create is a gable roof. Pick **Gable** to make it active.
5. The option in the F1 area should be **RectRoof**. If it says **PolyRoof**, pick it to change it to **RectRoof**. This will allow you to model a rectangular roof area.
6. The **Join** option should be turned off. If it is active, pick it to turn it off. You will use this option later to join a new roof to an existing one.
7. Pick the **Settings** option.
8. Pick **PlatHgt** (Plate Height).
9. Type in **8** and press Enter. For this exercise, you will use the height of your walls as the plate height.
10. Pick **Pitch**.
11. Pick the **4:12** option.
12. Pick **RoofThck**.
13. Type in **.10** and press Enter to create a roof 10" thick. This will make it look like there is a 10" fascia board.
14. Pick **Overhng**.
15. Type in **2** and press Enter to create a 2'-0" overhang.
16. Pick **WallThck**.

17. Type in **.4** and press Enter. This wall thickness should match the walls in your condo. This option works with the option called EndWall. When the EndWall (raked wall added under the eaves) is made, it will be a 4" wall.
18. Make sure the option in the **F0** position says **SoffIncl** (Soffit Inclined). If it says **SoffHorz**, pick it to change it to **SoffIncl**.
19. Check the option in the **S1** position. It should say **FaciaPlb** (vertical or plumb fascia). If it says **FaciaSqr**, pick it to change it to **FaciaPlb**.
20. Pick **EndWall** until it is active.
21. Now, all of the settings are adjusted. Press mouse button 3 to exit the settings menu.

Creating the first roof

To define a gable roof, you need three points. The first 2 points you define will be the lower edge of one side of the roof. The third point will be the width of the roof along the gable. These points must be in a *clockwise* direction. (If you pick the points in a counter-clockwise direction, your roof will be upside down!)

1. Object snap to the upper left corner of your condo to define the first corner of the edge of the roof. This is shown as step 1 in Figure 8.10.
2. Object snap to the upper right corner to define the second edge of the roof, as shown as step 2 in Figure 8.10.

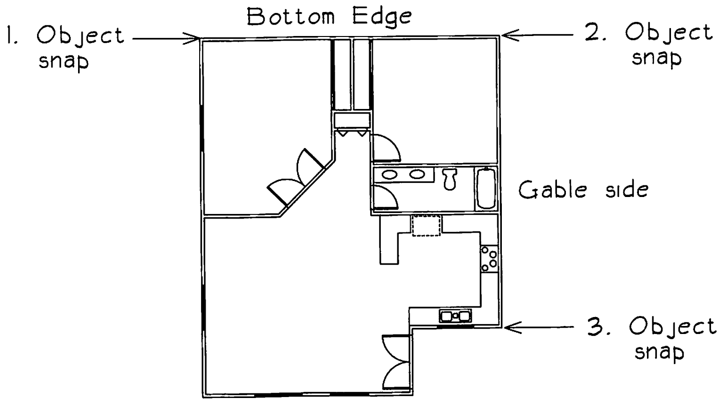


Figure 8.10: Steps to define the first roof.

3. Object snap to lower right corner of the kitchen to define the width and edge of the gable. This is shown as step 3 in Figure 8.10.
4. The first roof will be created. (Notice the calculation time is displayed in the message area.) This could take a minute or two.

Joining a roof

The second gable roof will be joined to the first.

1. Pick the **Join** option to make it active.
2. Object snap to the upper right corner of the outside wall at the entry, shown as step 1 in Figure 8.11.
3. Object snap to the lower right corner of the entry area, shown as step 2 in Figure 8.11. This will define the lower edge of your roof. (Edge parallel to the ridge.)

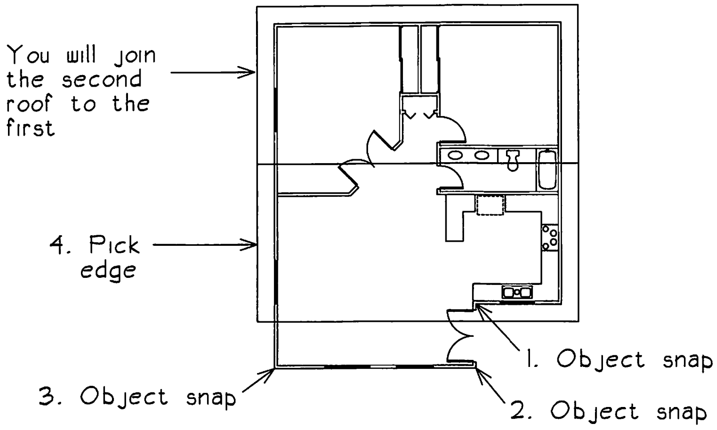


Figure 8.11: Steps for joining a roof.

4. Object snap to the lower left corner, shown as step 3 in Figure 8.11. This will define the width and the gable of your roof.
5. Now you will be asked to select a plane to join to. Pick the front edge of the roof plane you wish to join to, shown as step 4 in Figure 8.11. The roof will be created, as in Figure 8.12.

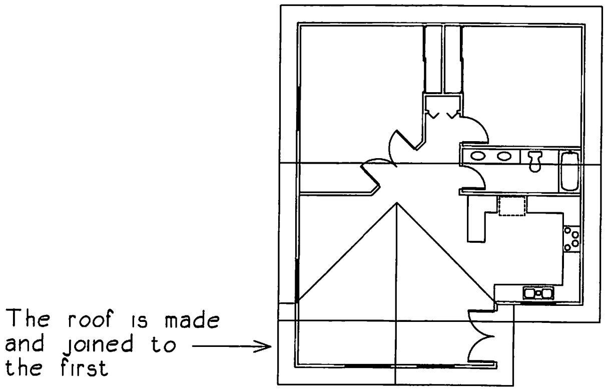


Figure 8.12: The gable roofs are complete.

Use Quick Key

Shift

F

6. Press **(Shift) F** to File save your drawing.

Checking the roof in 3D

Use Quick Key

J

Now you may want to see the roof shaded.

1. Press **J** to go to the 3D Edit menu.
2. Pick **QShader**.

3. Pick the **Para button** in the control panel. This will take you back to the last parallel view you had defined, which happens to be your isometric view.
4. Pick **Begin**. How does your roof look?

Creating a 3D perspective

Creating a perspective is very easy also.

1. Pick the **V button** in your control panel.
2. Pick the **SetPersp** option.
3. Pick the **E button** to get a full view of your condo.
4. Press **(Page Up)** about three times to stand farther away from your condo. This will give you plenty of picking space to establish your standing "eye-point".
5. Pick your standing "eye-point" position, as shown as step 1 in Figure 8.13.

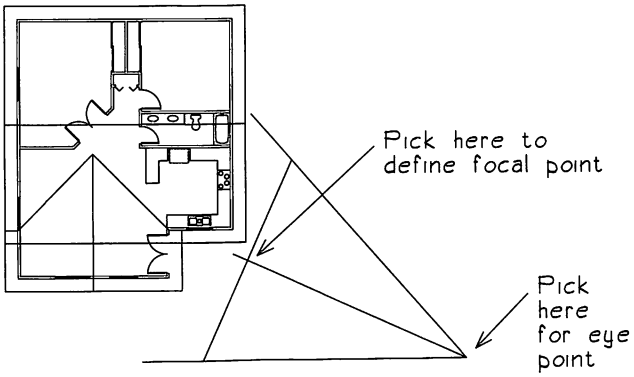


Figure 8.13: Steps for defining a perspective.

Use Quick Key

O

6. Pick your focal spot (view center), as shown as step 2 in Figure 8.13. You may want to turn OFF Orthomode if it is on, to make picking easier, by pressing **O**.
7. The perspective will be displayed!
8. Press **J** to go to the 3D Edit menu.
9. Pick **QShader**.
10. Pick **LightL**.
11. Pick **Begin**. Do you like your perspective? (See Figure 8.14.)

Use Quick Key

J

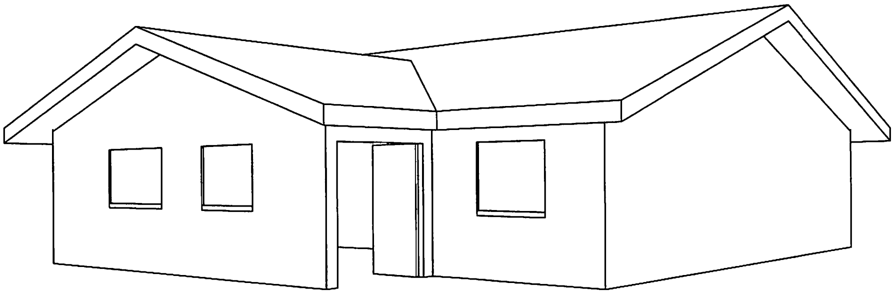


Figure 8.14: The perspective shaded.

Creating a print of your shaded drawing

If you have a printer that will print pixel format (the DataCAD User Reference manual lists many that do), you can print out the shaded image of your condo.

1. Get the perspective or isometric you are happy with.
2. Pick the **E button** in the control panel to get the full extents of your drawing.
3. Use **QShader** to shade the image. *Do NOT use a windowing function after the image is shaded, as you will lose the shading.*
4. Press the **(;)** key to go to the 2D Edit menu.
5. Press mouse button 3 to go to the Utility menu.
6. Pick the **File I/O** option.
7. Pick **PixelOut**.
8. Pick **AllDwg** to make it active.
9. Make sure **Inverse** is NOT active. This would make the entire background black.
10. Pick the **Lndscape** option until it is active. This will turn your drawing 90 degrees on the paper and should fit better.
11. Pick the **EnlrgFac** option. Type in **3** and press Enter. You may want to adjust this later to get better results.
12. If you have a printer connected, pick **ToPaper**.

Use Quick Key

;

Creating a 3D perspective line drawing

Use Quick Key

J

You can create a line drawing the this same perspective.

1. Press **J** to go to the 3D Edit menu.
2. Pick **Hide**. (The quick key for Hide is **(Shift) Y**.)
3. Pick **SaveImg** until it is active.
4. Pick **Begin**. Hidden lines will be removed.
5. When the hide is complete you will be prompted to save the image. Pick **NewLyr**.

6. Type in a name for your new layer: **PerpHide** and press Enter.
7. Pick **On**.

Use Quick Key

L

8. Press **L** to go to the Layers menu.
9. Pick **ActvOnly**.
10. Pick **PerpHide**. You will have to use **NextPage** to see it.
11. Press mouse button 3 to exit.
12. The image will look funny at this point, because you are still in a perspective mode. The flattened image is laying on the ground in perspective. Pick the **Ortho button** in the control panel to return to the plan view..
13. Notice that there are lines on your drawing you may not want, especially where the headers and sills were. But it is easy to clean them up!

Use Quick Key

E

14. Press **E** to go to the Erase menu.
15. Pick **Entity** to make it active.
16. Pick the lines you wish to erase. In some instances there will be double lines. This is where two edges were, leaving a line for each edge.

Use Quick Key

Esc

17. To help erase items, press the **(Esc)** key to see if there are any double lines. (Double lines are really lines under lines, so you must erase them twice!)
18. Other editing options, such as 2 line trim, work also. Remember, this image is now flat.

Use Quick Key

Shift

F

19. Your perspective is now a normal drawing, and can be plotted just like any other drawing.
20. Press **(Shift) F** to File save your drawing.
21. You may want to create a "Pictogram" of your perspective for viewing when you are in the opening DataCAD screen. Remember, this option is found in the **File I/O**, **PixelOut** menus.

Chapter summary

During this chapter, you learned:

How to create an isometric parallel view.

That the view center of the parallel view is defined using the 3D Views, Controls menu.

Q-Shader is a fast way to get a shaded image of your drawing.

Adjusting the Z-base and height allows you to draw walls at different 3D heights.

3D Roofs can be added using the ROOFIT macro.

Creating a 3D perspective is very easy. The perspective can be shaded or used as a line drawing.

Shaded images can be printed out to paper using the File I/O, PixelOut menus.

The 3D view can have hidden lines removed automatically using the Hide menu.

The line image can be saved to a layer once the hidden lines are removed. Once on a layer, it can be edited.

CHAPTER 9

Elevation Drawings

Elevations can be created in 2D from scratch or, as in this case, an elevation can be "extracted" from a 3D model. Even though your drawing is a mixture of 2D and 3D, there is enough in it to give you a nice elevation with just a little more work.

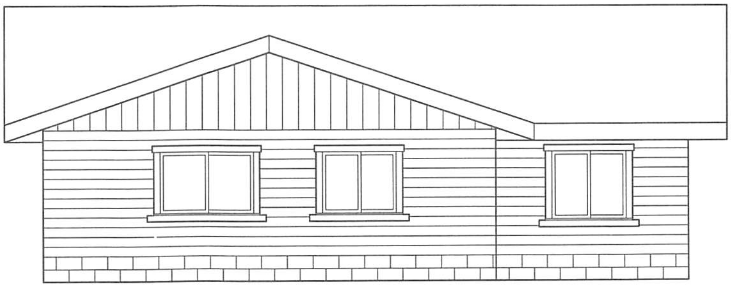


Figure 9.1: An elevation of the single condo.

Adding new layers for your 3D doors and windows

DataCAD has a special macro to help you quickly create 3D modeled windows and doors. You will turn off all of the layers except for walls in order to create the items easily. And, you will add one new layer just for your 3D doors and windows.

Use Quick Key!

L

1. Press **L** to go to the Layers menu.
2. Pick **ActvOnly**.
3. Pick **Walls**.
4. Press mouse button 3 to exit back to the Layers menu.

5. Pick **NewLayer**.
6. Type in or pick **1** and press Enter.
7. Pick **Name**. The layer list will be displayed.
8. Pick **NextPage** to find the last layer you made.
9. Pick the last layer. The layer number will be displayed in the message area.
10. Type in the new name for your layer: **3dWnwDrs** and press Enter.
11. Press mouse button 3 to exit the Name menu.

Use Quick Key!

Tab

12. Press the **(Tab)** key until the active layer is **3dWnwDrs**.
13. Pick **Color**.
14. Pick **White**.
15. Press mouse button 3 to exit the Layers menu.

Setting up the AEC MODEL macro

The macro to model windows and doors is called AEC_MODEL. The first time you use this macro, you will want to set how the window will look. This set-up includes the sizes of the structure (jamb, sill, trim, etc.) and the different window and door types available.

Use Quick Key!

Shift

M

1. Press **(Shift) M** to go to the Macros menu.
2. Pick the **AEC_MODL** macro.
3. Pick **Windows**.
4. Make sure the **In Plan** option is active.
5. Pick **WndwForm**. This option will allow you to see the different settings in a one-page form. (All of these settings are available in separate sub-menus from the main Window menu.)
6. The first option, Sill Hght, will be highlighted. You can move your cursor to the different lines by pressing the **(Tab)** key. Once you have made a change to the option, you must press **Enter** to accept it. If you overshoot an option, you can press **(Shift) (Tab)** to go backwards.
7. For **Sill Hght:**, type in **3.5** and press Enter.
8. For **Head Hght:** type in **6.8** and press Enter.
9. **(Tab)** pass **Wall Thk:** as it is not needed for windows created in the plan view.
10. For **Window Type:** press the (Space bar) until it reads **Double Hung** and press Enter.
11. For **% open:** type in **0** and press Enter.
12. The next options are for Casing. Casing is defined as being on the outside of the window. Press (Tab) until you reach the **Casing** options.
13. For **I At Head** press the (Space bar) to set **Yes** and press Enter.

14. For **Width:** type in **.4** and press Enter.
15. For **Thickness:** type in **.1** and press Enter.
16. For **Extension:** type in **.1** and press Enter.
17. For **I At Jambs** press the (Space bar) to set **Yes** and press Enter.
18. For **Width:** type in **.4** and press Enter.
19. For **Thickness:** type in **.1** and press Enter.
20. For **I At Sill** press the (Space bar) to set **Yes** and press Enter.
21. For **Width:** type in **.4** and press Enter.
22. For **Thickness:** type in **.1** and press Enter.
23. For **Extension:** type in **.4** and press Enter.
24. The next options are for Trim. Trim is defined as being on the inside. Since your elevation will show the outside, you do not have to create it.
25. For **I At Head** press the (Space bar) to set **No** and press Enter.
26. Press (Tab) until you reach the **I At Jamb** option.
27. For **I At Jamb** press the (Space bar) to set **No** and press Enter.
28. Press (Tab) until you reach the **I At Sill** option.
29. For **I At Sill** press the (Space bar) to set **No** and press Enter.
30. For **Head** press the (Space bar) to set **No** and press Enter.
31. For **Jamb** press the (Space bar) to set **Yes** and press Enter.
32. For **Jamb Width:** type in **.4** and press Enter.
33. For **Jamb Thk:** type in **.1** and press Enter.
34. For **Sill** press the (Space bar) to set **Yes** and press Enter.
35. For **Sill Thk:** type in **.1** and press Enter.
36. For **In Ext:** type in **.2** and press Enter.
37. For **Out Ext:** type in **.2** and press Enter.
38. For **Side Ext:** type in **.3** and press Enter.
39. For **Sash** press the (Space bar) to set **Yes** and press Enter.
40. For **Sash Width:** type in **.2** and press Enter.
41. For **Sash Thk:** type in **.1** and press Enter.
42. For **Offset:** type in **0** and press Enter.
43. For **Muntins** press the (Space bar) to set **No** and press Enter. There will be no muntins in our sliding window.
44. Press the **(Tab)** until you reach the Glass options
45. For **Glass** press the (Space bar) to set **Yes** and press Enter.
46. For **Glass Thk:** type in **.0.1/8** and press Enter.
47. For **Qty Horz:** type in **1** and press Enter.

Use Quick Key!

Esc

48. For **Qty Vert:** type in **1** and press Enter. (Later, if you wish to add more panes in your window, remember to set up the muntins.)
49. Press the **(Esc)** key to exit and save your changes to the form.

***Note:* DO NOT** *press mouse button 3 to exit this form, as all changes would be lost, and you would have to do these steps all over again.*

Creating the first window

The first window you will create is one of the front windows.

1. Pick the **W button** in the control panel to go to the Window-In menu.
2. Pick two diagonal points to zoom into the area shown in Figure 9.2.
3. Press mouse button 3 to exit the Window-in menu.

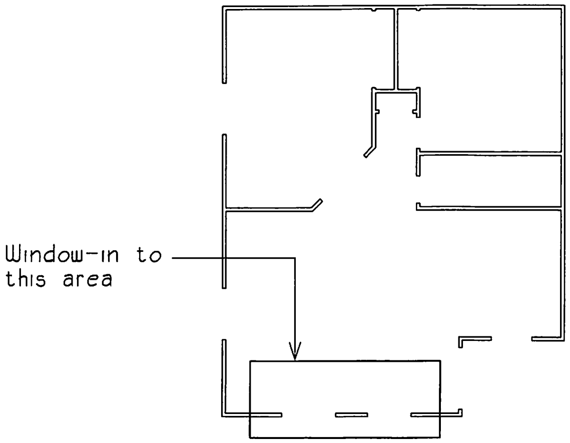


Figure 9.2: Area to window-in on.

Use Quick Key!

Z

4. Press the **Z** key.
5. Type in **0** for the Z-base and press Enter. Now the 3'-5" you defined for the sill height will be measured off of the 0 base elevation. (If you were working on a second floor, you could have the Z-base set to something like 13'.)
6. Type in **8** for the Z-height and press Enter.
7. Object snap to the front inside edge of the window opening, as shown in Figure 9.3 as step 1.

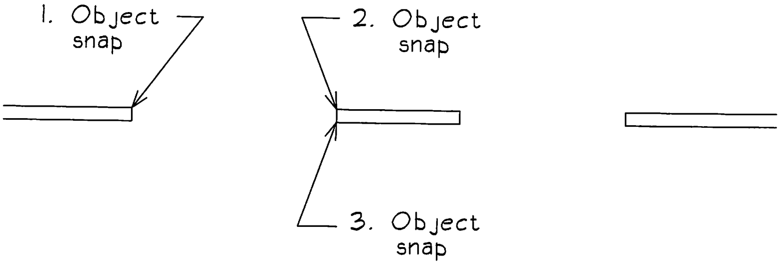


Figure 9.3: The steps for creating a modeled window.

8. Object snap to the other front inside edge of the window opening, as shown in Figure 9.3 as step 2. This will define the width of the window.
9. Now object snap to the outside edge of the window opening, as shown in Figure 9.3 as step 3. This will define the depth of the window opening (wall width).
10. Your window will be added, as shown in Figure 9.4.

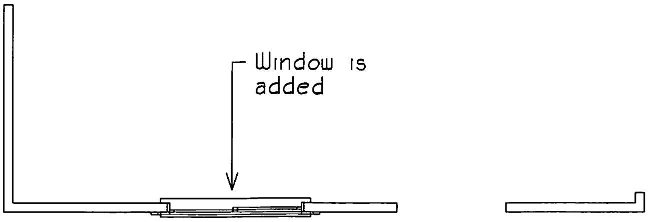


Figure 9.4: The modeled window is added.

11. To see how your window looks in the elevation view, pick the **Front button** in the control panel.
12. Pick the **E button** to get the view Extents. How does it look? (See Figure 9.5.) If necessary, pick the **R button** to Recalculate the view extents.

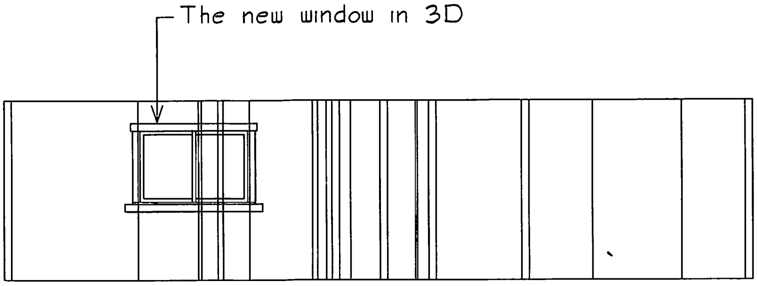


Figure 9.5: The modeled window in elevation.

13. Pick the **Ortho button** to go back to the plan view.
14. Following the same steps, add the second window. Remember to object snap to the two outside points of the wall opening, then object snap for the third point on the inside edge of the opening. Your window should look like figure 9.6.

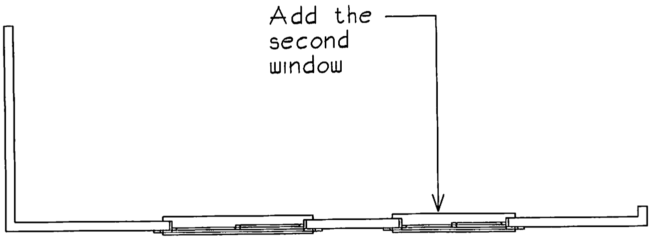


Figure 9.6: The second modeled window is added.

15. To see how your second window looks in the elevation view, pick the **Front button** in the control panel.
16. If necessary, pick the **E button** to get the view Extents. How does it look? (See Figure 9.7.)

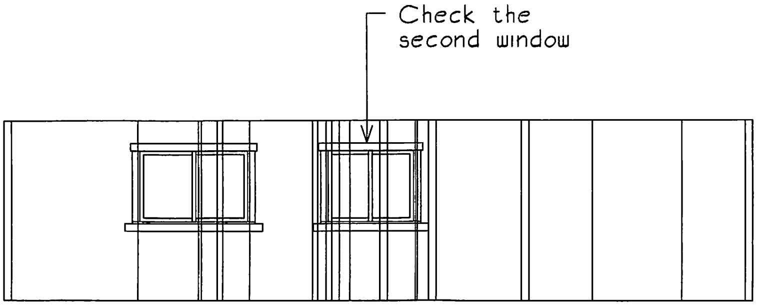


Figure 9.7: Viewing both windows in elevation.

17. Pick the **Ortho button** to go back to the plan view.

Adding the kitchen window

You will have to change the sill height of the window to fit properly in the kitchen opening.

1. Pick **WndwForm**.
2. Change the **Sill Hght** to **3.1** and press Enter.

***Note:** You may have used a different sill height for your kitchen window, as discussed earlier in the previous chapter. Use the appropriate sill height as necessary.*

Use Quick Key!

Esc

3. Press **(Esc)** to save the change.
4. Object snap to the two inside edges of the window opening for the first two points. Object snap to the outside edge for the width of the wall. The window will be made, as shown in Figure 9.8.

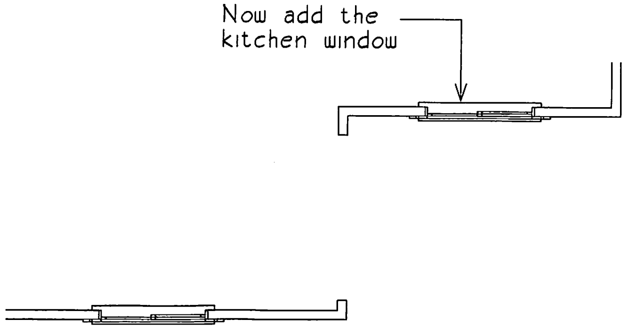


Figure 9.8: The kitchen window is added.

5. To see how all of windows look in the elevation view, pick the **Front button** in the control panel. These 3 windows are all you will have to add for the front elevation. The three windows are shown in Figure 9.9.

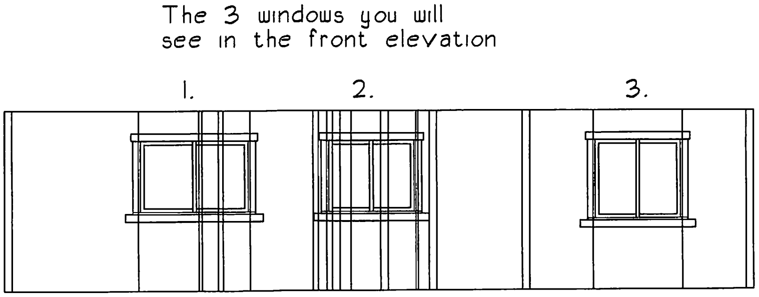


Figure 9.9: Three windows are all that are seen in the front elevation.

Creating the hidden line elevation

You will want to turn on the necessary layers before performing the hidden line removal.

Use Quick Key!

L

1. Press **L** to go to the Layers menu.
2. Pick **On/Off**.
3. Turn on the **HeadSill** and **Roof** layers, by picking the layer names until they are displayed.
4. Press mouse button 3 to exit the On/Off menu.
5. Press **(Shift) Y** to go to the DCAD 3D, Hide menu.
6. Make sure the **SaveImg** option is active.
7. Pick **Options**.
8. Make **DelDoubl** active. This option will help to eliminate duplicate lines that can occur when two edges come together.
9. Make **BackFace** active. This will allow the program to ignore the part of your drawing that is behind the front of the elevation. (Parts of the condo you cannot see anyway.) Making this option active will greatly improve the speed of the hidden line removal process.

Use Quick Key!

Shift

Y

10. The other options should be inactive.
11. Press mouse button 3 to exit the Options menu and return to the main Hide menu.
12. Pick **Begin**.
13. When the hidden line removal is complete, pick the **NewLyr** option.
14. Type in the new layer name: **FrntElev** and press Enter.
15. Pick **On**.
16. Press **L** to go to the Layers menu.
17. Pick **ActvOnly**.
18. Pick **NextPage** until you see the FrntElev layer.
19. Pick **FrntElev**. Now the elevation will be the only layer displayed.
20. Press mouse button 3 to exit.
21. You may see the elevation view appear flat on your screen. Pick the **Ortho button**.
22. Pick the **E button** for the view Extents. Your elevation will look similar to Figure 9.10.
23. Press **(Shift) F** to File save your drawing.

Use Quick Key!

L

Use Quick Key!

Shift

F

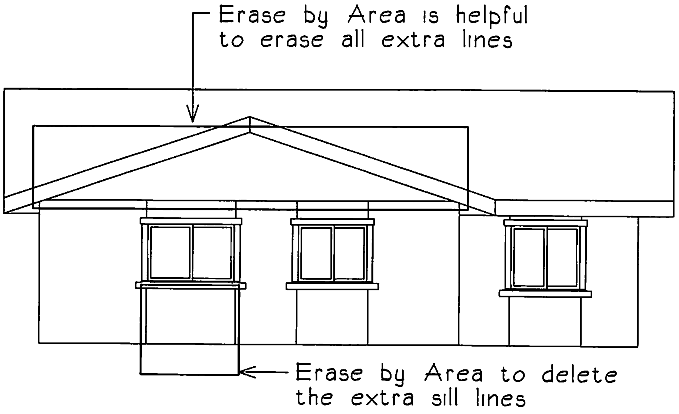

Erase by Area is helpful to erase all extra lines
Erase by Area to delete the extra sill lines

Figure 9.10: The elevation after a hide.

Cleaning up the elevation

After completing the hidden line removal, there will be extra lines to erase.

Use Quick Key!

E

1. Press **E** to go to the Erase menu.
2. Pick **Area**.
3. Indicate small boxes around lines you wish to erase. In this way, all of the extra edge lines that are on top of each other will be erased.

Note: *If you used the DelDoubl option in the Hide, Option menus, most of the edge lines in your drawing will not have extra lines on top of each other.*

---

4. Use **Fence** and **Entity** when necessary. Your condo should now look like Figure 9.11.

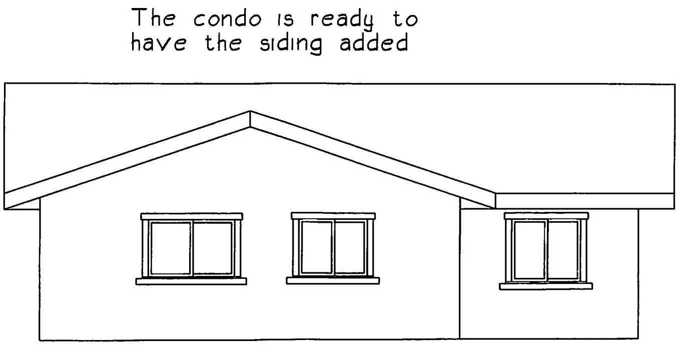


Figure 9.11: The elevation after it is cleaned up.

Creating the layer for the siding

You will create the hatch for the siding on its own layer.

Use Quick Key! L

1. Press **L** to go to the Layers menu.
2. Pick **NewLayer**.
3. Press Enter to accept **1**.
4. Pick **Name**.
5. Pick **NextPage** to find the new layer.
6. Pick the last layer on your list. This will be your new layer.
7. Type in **ElevSidg** and press Enter.
8. Press mouse button 3 to exit.
9. Press **(Tab)** to make the **ElevSidg** layer active.
10. Pick **Color**.
11. Pick **Brown**.

Use Quick Key! Tab

Adding the siding

You will use the Hatch feature to create your siding textures.

Use Quick Key! H

1. Press **H** to go to the Hatch menu.
2. Make sure **Associat** is active.
3. Pick **HtchType**.
4. Pick **OutLine** to make it active. Having the outline displayed will help you keep track of it as you define your boundary.
5. Pick **Pattern**.

6. Pick the hatch pattern called **Line**. You may have to pick **NextPage** to find it.

7. Pick **Scale**. For the Line pattern, a scale of 32 equals 1" spaced line. You will want to add 6" siding for your elevation. So, multiply 32 by 6 and you will have 192 as your scale.

8. Type in **192** and press Enter.

9. Pick **Boundary**.

10. Object snap to all corners of the left front of the house, as shown by the dark boundary in Figure 9.12. You will make one continuous boundary around the outside and the windows. Remember, the hatch polyline can only have 36 sides, so dividing up a hatch into sections is helpful.

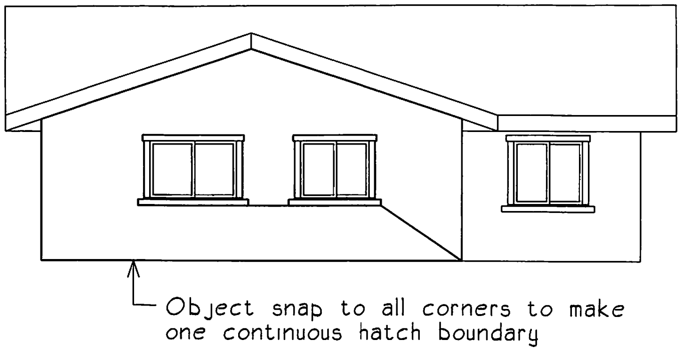

Object snap to all corners to make one continuous hatch boundary

Figure 9.12: Creating the first hatch boundary.

11. Once the boundary is made, press mouse button 3 to close it.

12. Pick Origin.

13. Object snap to the lower left corner of the condo for the origin of your siding, as in Figure 9.13.

14. Pick **Begin**. The 6" siding will be created, as illustrated in Figure 9.13.

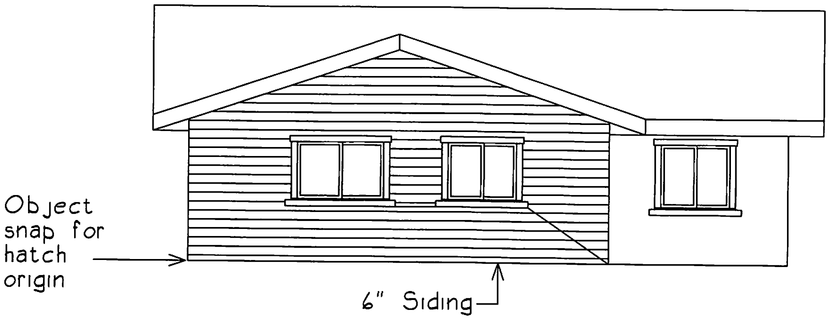


Figure 9.13: Six-inch siding is added.

15. Pick **Boundary** again.

16. Now, object snap to all of the corners around the kitchen wall and window. As before, you will make one continuous boundary around the outside and the windows, as shown in Figure 9.14.

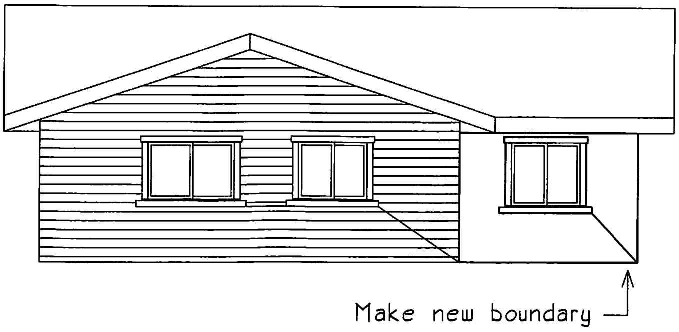


Figure 9.14: Make a boundary for the kitchen wall area.

17. Pick **Begin**. The rest of the siding will be created.
18. Pick **Entity** to make it active.
19. Pick the 6" hatches you just created. They will become grey and dashed.
20. Pick **HtchType**.
21. Pick **NoOutLin** to make it active.
22. Press mouse button 3 to exit back to the Hatch menu.
23. Pick **Begin**. The outlines will disappear.
24. Press **(Esc)** to refresh the screen.
25. Now your drawing should look like Figure 9.15.
26. Press **(Shift) F** to file save your drawing.

Use Quick Key!
Esc

Use Quick Key!
Shift
F

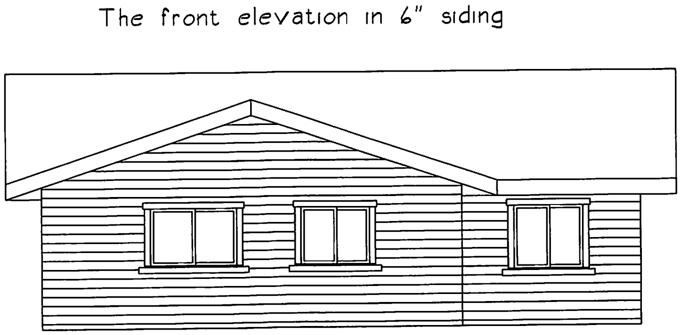


Figure 9.15: The elevation with 6" siding.

Changing the siding

You may want to have a more interesting siding option in your elevation. Before you adjust the siding, you will make a copy of the elevation and modify the copy!

Use Quick Key!
C

1. Press **C** to go to the copy menu.
2. Make sure Orthomode is ON (O).
3. Pick a point above the top of the elevation, as shown as step 1 in Figure 9.16. When you move the cursor, you will notice an arrow is attached.

4. Pick a point below the condo, as shown as step 2 in Figure 9.16. This will define your copy distance.
5. Pick **Area**.
6. Make sure **LyrSrch** is active.
7. Indicate a box around the entire condo elevation. The copy will be made. If it is not in a desired location, as shown in Figure 9.16, pick **Undo** and define a **NewDist** or use the **Move** menu.

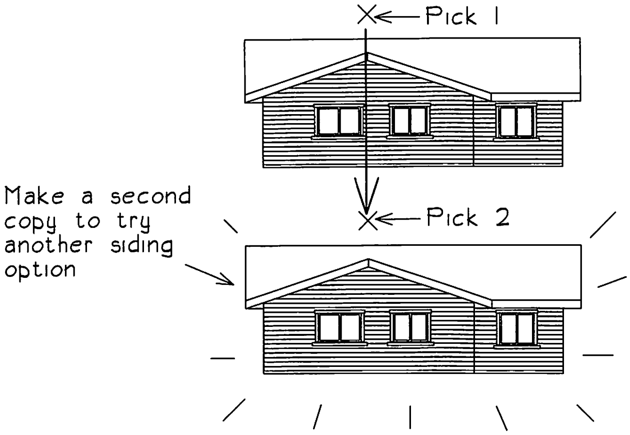


Figure 9.16: A copy is made to modify.

Deleting a hatch vertex

Use Quick Key! Shift M

Since the associated hatch boundary is a polyline, the hatch boundary can be modified using the POLYLINE macro. The hatch boundary does not need to be displayed to modify it!

1. Press **(Shift) M** to go to the Macros menu.
2. Pick **POLYLINE.**
3. Pick **DelVertx.**
4. Pick the hatch boundary on the left with the two front windows, as shown as step 1 in Figure 9.17. The outline will blink.
5. Pick the boundary corner at the top of the roof peak, as shown as step 2 in Figure 9.17. This corner will be deleted from the boundary.

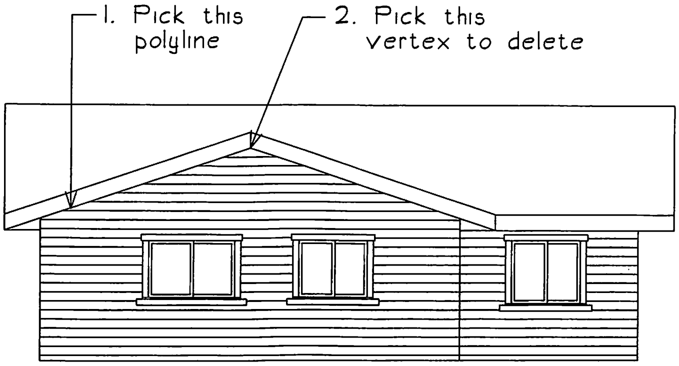


Figure 9.17: The steps for deleting a polyline vertex.

6. The hatch will automatically update to the new boundary outline, as shown in Figure. 9.18.

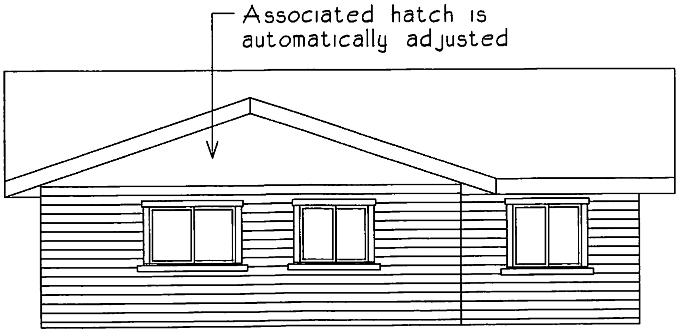


Figure 9.18: The associated hatch is updated.

Adding an above grade basement area

To further enhance the elevation, you will add detail showing the above ground level part of a basement to your elevation.

Use Quick Key!

Tab

1. Press **(Tab)** to make the **FrntElev** layer active.
2. Make sure your Walls are OFF (SwOTHLUD). The quick key to turn them on and off is **(=)**.

Use Quick Key!

Alt

R

3. Press **(Alt) R** to go to the Polygon menu.
4. Make sure the **RectAngl** option is active.
5. Turn off **CntrPnt**.
6. Object snap to the lower left point of the condo, as shown as step 1 in Figure 9.19.

Use Quick Key!

~

7. Press the (~) reference key.
8. Define a reference point to measure from, by object snapping to the lower right point of the front area, shown as step 2 in Figure 9.19.
9. Press the **(Space bar)**.
10. Press Enter to accept **0** for the X distance.

11. Type in **-1.3** for the Y distance and press Enter. Your drawing should look like Figure 9.19.

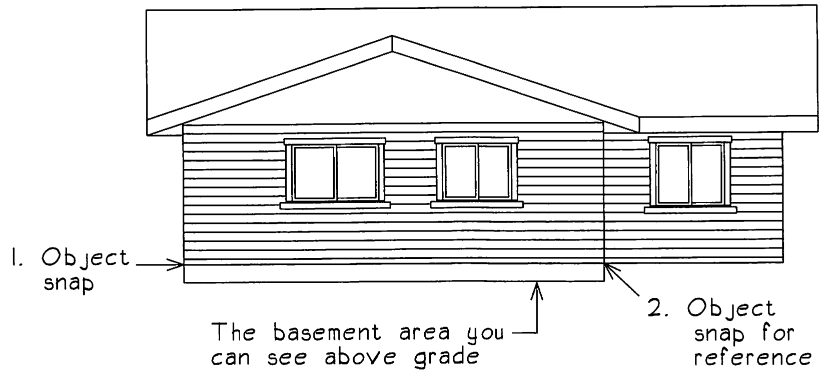

1. Object snap
The basement area you can see above grade
2. Object snap for reference

Figure 9.19: The rectangle defines the basement area.

12. Object snap to the lower right edge of the new basement rectangle, as shown as step 1 in Figure 9.20.
13. Object snap to the lower right corner of the kitchen wall, as shown as step 2 in Figure 9.20.

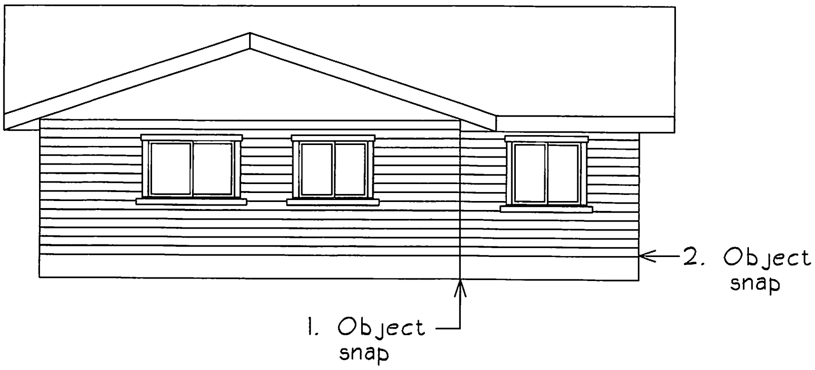


Figure 9.20: The above grade basement area is added.

Use Quick Key! Shift F

14. Press **(Shift) F** to file save your drawing.

Adding the vertical siding

You will use the line pattern again to create the vertical siding by the roof line.

Use Quick Key! H

1. Press **(Tab)** to make the **ElevSidg** layer active.
2. Press **H** to go to the Hatch menu.
3. Pick **Boundary**.
4. Object snap to the three points that make up the area shown in figure 9.21. You may want to turn off Orthomode.

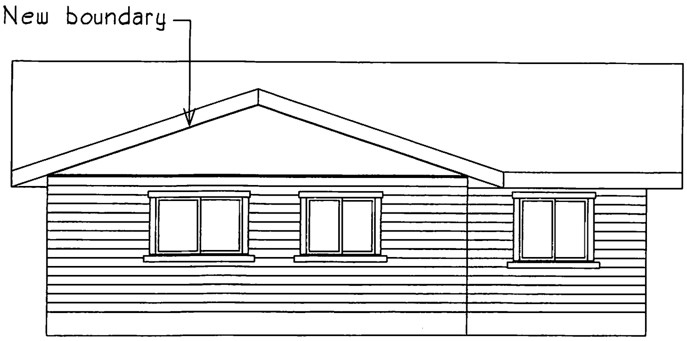


Figure 9.21: The boundary for the vertical siding.

5. Press mouse button 3 to close the boundary.
6. Pick **Scale**.
7. Type in **320** to make 10" planks. Press Enter.
8. Pick **Angle**.
9. Type in **90** and press Enter. This will define a vertical siding.
10. Pick **Origin**.
11. Pick, do not object snap, to the peak of the wall, as shown in Figure 9.22. Picking should move the origin just slightly to one side of the corner, making sure the hatch line doesn't turn off.

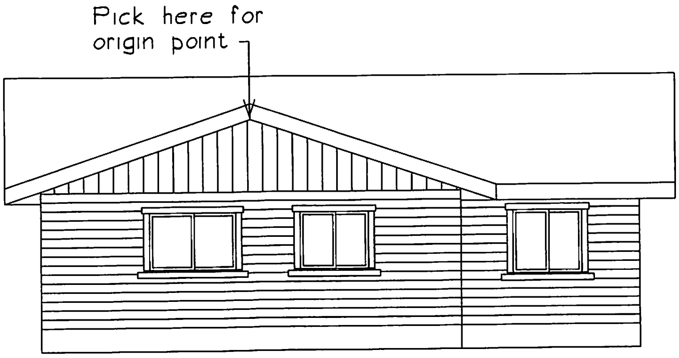


Figure 9.22: Showing the origin and the siding.

12. Pick **Begin**. The vertical siding will be created.

Creating the basement block wall

1. Pick **Pattern**.
2. Pick **CMU**. (Concrete Masonry Units.)
3. Pick **Scale**.
4. Type in **32**. This will create a 8"x16" block. Press Enter.
5. Pick **Angle**.
6. Type in **0** and press Enter.
7. Pick **Boundary**.

8. You will divide the basement area into two areas: the front of the house; and the kitchen wall area. Object snap to the four corners for the front of the house to make the rectangle, as shown in Figure 9.23.

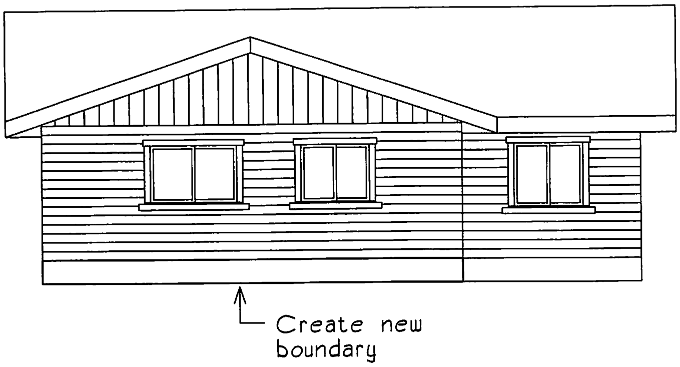


Figure 9.23: Define a boundary for the blocks.

9. Press mouse button 3 to close the boundary.
10. Pick **Origin**.
11. Object snap to the lower left corner in order to begin with a full brick there.
12. Pick **Begin**. Your drawing should look like Figure 9.24.
13. Pick **Boundary** again.
14. Object snap to the four corners of the last area, under the kitchen window, as shown in Figure 9.24.

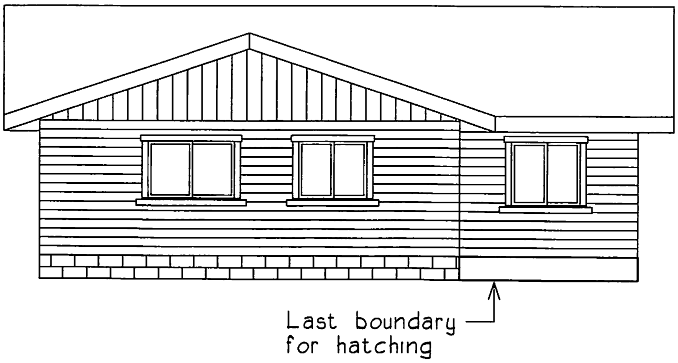


Figure 9.24: Defining a second boundary for the blocks.

23. Press mouse button 3 to close the boundary.
24. Pick **Origin**.
25. Object snap to the lower right corner to start a full brick there.
26. Pick **Begin**. Your drawing should look like Figure 9.25.

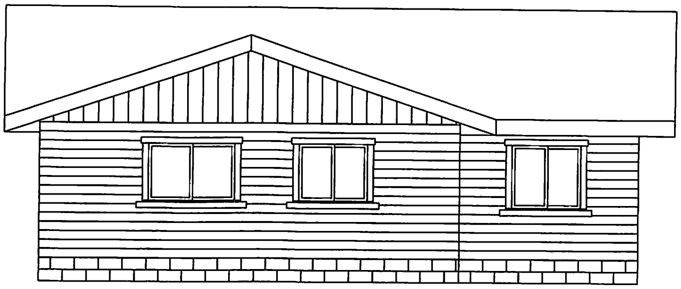


Figure 9.25: The blocks are added to the elevation.

Creating a full elevation of dual condos

Now you can put two condos side-by-side!

Use Quick Key!

Alt

M

1. Press **(Alt) M** to go to the Mirror menu.
2. Object snap to the lower right corner for the first point of the reflection line. This is shown as step 1 in Figure 9.26.

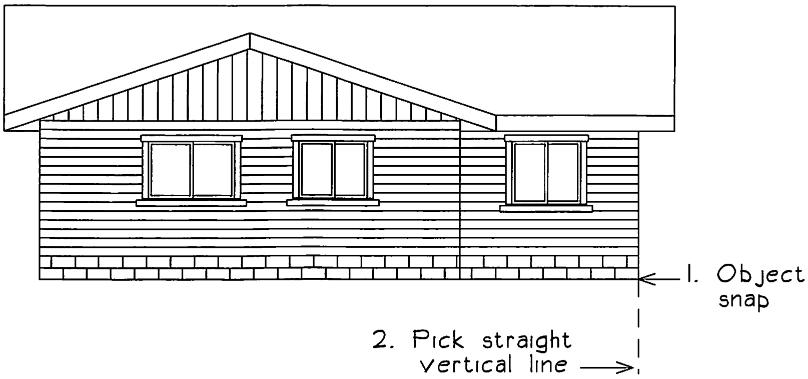


Figure 2.26: Define a mirror reflection line.

3. Make sure Orthomode is on. (O = On/Off.)
4. Pick a second point to indicate a straight vertical line, also shown in Figure 9.26.
5. Pick **Area**.
6. Pick **LyrSrch** until it is active.
7. Make sure **AndCopy** is active.
8. Box around the entire condo. The copy will be mirrored, as shown in Figure 9.27.

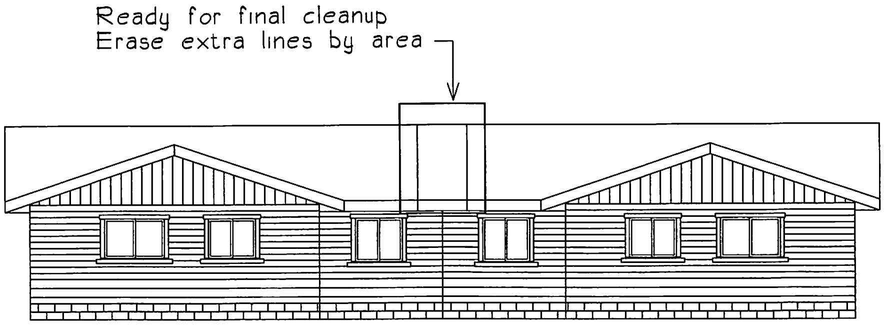


Figure 9.27: A copy is mirrored.

9. Clean up the elevation by erasing the extra lines on the roof, as shown in Figure 9.27.

Adding the final touches

Use Quick Key!

K

1. Press mouse button 3 to exit the Erase menu.
2. Press **(Tab)** to go to the **FrntElev** layer.
3. Press **K** until the color is **Lt Blue**.
4. Draw two short lines on the left window to indicate a glass shine, as shown in Figure 9.28. (Walls should be OFF.)

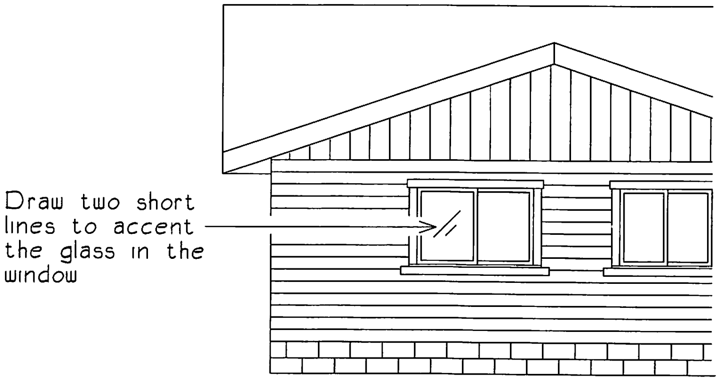


Figure 9.28: Draw two short lines for glass.

Use Quick Key!

M

5. Press **M** to go to the Move menu.
6. Pick **Drag**.
7. Pick **AndCopy** until it is active.
8. Pick **Area**.
9. Indicate a box around the two lines.
10. Pick in the middle of the two line to indicate a move point.
11. Making sure Orthomode is active, drag the copies over to the next window on the right and pick, as shown in Figure 9.29.

Pick to place new copies

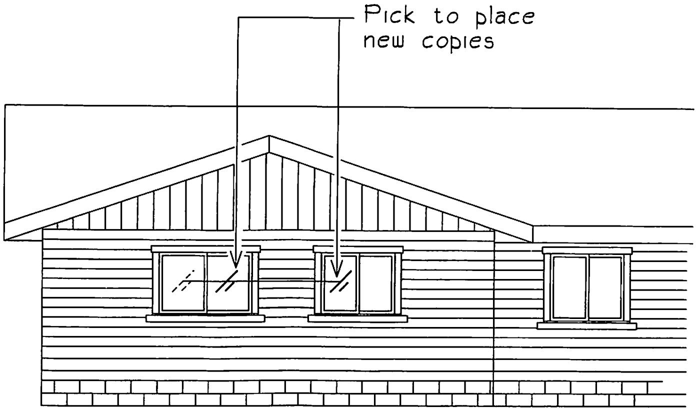


Figure 9.29: Copy the glass lines to new locations.

12. Drag the copies over to the next window on the right and pick.
13. Continue adding copies to all windows, as shown in Figure 9.30.
14. When you are done, press mouse button 3 to return to the Move menu. (Notice there is **no Undo** when you use Drag, so it is very important to be careful.)
15. ***TURN OFF*** the **AndCopy** option before exiting the Move menu!
16. Add a title to your elevation, as in Figure 9.30. You may want to create the elevation title in White and the scale notation in Green.
17. Use the **Layer** menu, On/Off option to turn on the **Border** layer.
18. Use **Move** (double check AndCopy is OFF), to move the elevation until it is nicely centered within the border.
18. Press **(Shift) F** to file save your drawing.

Use Quick Key!

Shift

F

The finished front elevation of your condo

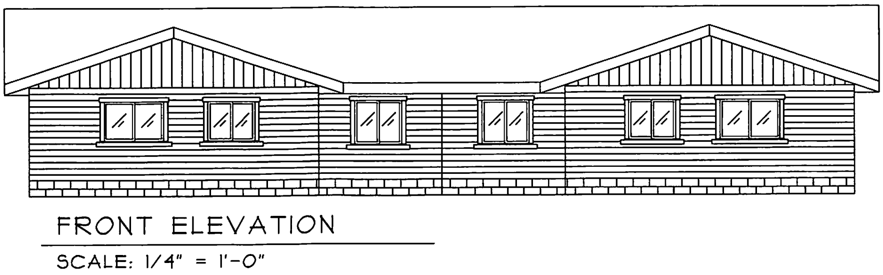


Figure 9.30: Add finishing touches to your elevation.

Chapter summary

During this chapter, you used many skills that you already learned in previous chapters. You also learned:

How to create windows using the AEC_MODL macro.

You can quickly go to elevations views using the control panel.

Elevations drawings are easily created using existing floor layouts.

Several options can be set in the Hide menu to make hidden line removal of elevations faster.

Modifying associated hatching boundaries can be accomplished using the POLYLINE macro.

The AndCopy feature of Move allows you to access the Drag feature for copying.

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